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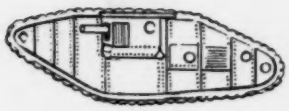

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ARMOR IN THB

2d Armored Division in the Ardennes Counteroffensive

*by Lieutenant Colonel E. A. Trahan**

PART I: The German Offensive

Colonel Trahan, G-2 of The Ground General School, tells the complete story of the 2d Armored Division's part in the Ardennes Counteroffensive in this two-part series. This series is probably the best and most complete yet published on Armor in the Bulge.

ON a day in the early winter of 1944, in the Caserne which lies just five miles south of the city of Krefeld, Germany, Von Rundstedt and his staff assembled to review the plans for the Ardennes Counteroffensive. An air almost of desperation must have hung heavily over the conference, for on the outcome of this venture depended the fate of Germany.

This regardless of the fact that Von Rundstedt, the commander of the German forces in the west, may himself have disapproved of the attempt. It must succeed. If it did, the Allied drive would be seriously impeded, perhaps stopped for a long period. Germany would be able to catch her breath and pull up her socks. Time would be gained in which she could perfect and make felt the full weight of her "secret" vengeance weapons. Jet planes would rise in swarms from her underground factories to rake the German sky clear of Allied bombers. Her army could be rebuilt and wage again its forte, a war of movement. In short, Germany still might win the war, or at least so prolong it that the Allies would gladly consent to favorable peace terms.

If the counteroffensive failed, however, then the war was lost for Germany. For the cream of units, men, supplies and equipment had been allotted to the attacking armies. The entire German front had been stripped, in order that the Fifth and Sixth Panzer Armies, and their support, the Seventh Army and the Luftwaffe, might lack nothing which could in any way contribute to success. With this military wealth spent in a fruitless effort, the German high command could not possibly hope to stem the Allied juggernaut that had rolled steadily from Normandy to the Siegfried Line. And, now, plans had reached a point from which there was no turning back. The die was cast.

In broad outline, the plan was simple. With his two powerful, well equipped and thoroughly trained Panzer armies, the Fifth and Sixth, Von Rundstedt would strike the eastern fringe of the Ardennes, a part of the Allied line that he knew to be thinly held. Surprised and overrun by the powerful mass of armor, the enemy could hope to offer little resistance. Through this breach in

*Staff, The Ground General School.

BULGE

the Allied line the German armies would roll, moving swiftly through a bridgehead over the historic Meuse, then, lancing north, engulf Brussels and finally Antwerp, on the coast. With the Allied front thus neatly sliced in half, the German Army could turn and destroy the northern part of the Allied line, isolated and with its back to the sea. Subsequent possibilities were limitless and bright with promise.

As Von Rundstedt reviewed the plan, which not he, as is commonly supposed, but Field Marshal Walter Model had evolved almost in its entirety, many factors argued for its success. As an advance guard for the attack, there was Colonel Otto Skorzeny, onetime soldier of fortune and rescuer of Mussolini, and his 150th Brigade. Trained in extreme secrecy, partly equipped with American uniforms, tanks, vehicles and equipment, many of its members speaking fluent English, the Brigade would move ahead of the attack, some of its members dropping by parachute behind the American line, to seize and hold the bridgehead over the Meuse through which the charging armor would roll. This was their actual mission, although once their operation had started rumor ran rife, and it was even suspected that they might be the intended assassins of the Allied Supreme Commander. Such a belief, though unfounded in truth, gained credence from the very nature of the unit, violating in almost every respect, as it did, the rules of land warfare. But this pattern was carried even further, and a fifth column was instituted, disloyal Belgians being recruited to operate for the Germans behind the American lines, reporting the movements and plans of the Allied forces.

Behind this advance guard would come the Fifth and Sixth Panzer Armies, the shock troops of the offensive. Together, the two armies comprised 16 divisions, seven in the Fifth, commanded by Manteuffel, and nine in the Sixth, commanded by the notorious and fanatical, though professionally incompetent, Sepp Dietrich. Seven of these were Panzer divisions, and of these, four, all in the Sixth Army, were SS divisions, the elite of the German Army. The two armies, as well as their supporting troops, had been assembled and trained under a veil of secrecy and security more complete and effective than in any operation before or since. No detail had been overlooked to insure that intelligence of the projected operation did not reach the Allies. Even when the divisions were moved forward, they were disposed in a manner which suggested their use as reinforcement for the line or for counterattack against Allied offensives, rather than their employment in an attack.

The German Attack

As a result, the attack on December 16, 1944, came with shocking suddenness. For the first time since Tunisia, American prisoners were taken in appreciable numbers. German armor lanced through the thinly held American sector in the Ardennes and drove westward with increasing momentum. Bastogne was surrounded and bypassed, the line of the Meuse threatened. In Germany, morale zoomed. This was more like the old days. The counteroffensive was succeeding beyond all expectations, and the German army was again advancing, with high hopes of a completely victorious campaign.

By December 22, two clouds only marred the bright horizon of German hopes. The first was the fact that no bridgehead yet existed over the Meuse. In this Skorzeny's 150th Brigade had utterly failed. His men, although in American vehicles and uniforms, speaking English, were still not quite authentic enough to escape being picked up in the immediate tightening of security which the attack caused. In addition, the personnel who were to be dropped by parachute were scattered, due mainly to faulty navigation by the pilots of the planes which carried them. In the end, the remnants of the Brigade were reduced to fighting in the line with the advancing armies.

The second jarring note was the failure to take Bastogne. Although it was surrounded and contained, and the advance still flowed around it, Bastogne was an important road and rail center, in the heart of the salient, and vital to the sustained drive of the offensive. Its heroic defense was a thorn, of no mean proportions, in the German side.

HEADQUARTERS
FIRST UNITED STATES ARMY
APO 230

5 January 1945

SUBJECT : Enemy Equipment Counted in CELLES (P-0679) Pocket.

TO : Commanding General, 2nd Armored Division.

THRU : Commanding General, VII Corps, APO 307.

1. The Second British Army has reported that the final count of enemy equipment found in the CELLES pocket is as follows :

Destroyed or Captured

81 tanks
7 assault guns
405 vehicles, all types
74 guns

2. It is believed that the bulk of this equipment belonged to the 2nd Panzer Division and that the tanks probably represent almost every operational tank in that division, since the German Panzer Div now contains a total of from 100 to 120 (maximum) tanks. The 74 guns represent the normal complement of over six battalions and would account for the complete divisional artillery and AT battalions normally under a division.

3. The action of your division therefore destroyed the 2nd Panzer Division as an armored division. This division has always been composed of first-class personnel from Austria, and therefore its overwhelming defeat by your division is regarded as an outstanding and distinguished feat of arms.

4. Please accept my heartiest congratulations to you personally and convey them to the officers and men of the 2nd U.S. Armored Division.

/s/ COURTNEY H. HODGES
Lieutenant General, U.S.A.,
Commanding.

Added in Marshal Montgomery's own hand :
My very best congratulations to the 2nd Armored Division.

/s/ B.L. MONTGOMERY,
Field Marshal.

1st Ind.

HEADQUARTERS VII CORPS, APO 307, United States Army, 6 January 1945.

To : Commanding General, 2nd Armored Division, APO 252, United States Army.

It is a genuine pleasure to transmit this fine letter of comendation from the Commanding General, First Army, and Field Marshal Montgomery, to which I add my heartiest congratulations.

s/ J. LAWTON COLLINS.
t/ J. LAWTON COLLINS.
Major General, U.S. Army,
Commanding.

The effect of Von Rundstedt's attack on the Allied armies was immediate and positive. Within hours troops were on the move toward the battle. Boundaries were shifted, units redeployed, rear areas organized for defense. Gradually the shoulders of the penetration were stabilized. But still the German armies poured through the breach, around the island of Bastogne, and out into the area east of the Meuse, where exact positions were unknown, and the air was tense with expectancy. Here was the sensitive point of the attack. If the line of the Meuse could be held while the salient was pinched by a simultaneous advance from both north and south, Von Rundstedt's offensive would fail, and in fact would face the prospect of being caught in a pocket as the shoulders moved in behind him. To that end, the Third U. S. Army began preparations for an attack from the south, while, on the north, the U. S. Seventh Corps was ordered by First U. S. Army to assemble out of contact for an attack to the south, the line of the Meuse meanwhile being held by British units.

Units assigned to the VII Corps for this attack were the 75th and the 84th Infantry Divisions and the 2d Armored Division. Of these, the 2d Armored and the 84th were from Ninth Army, while the 75th was a new unit, just then arriving from Normandy. It is the purpose of this article to trace the actions of the 2d Armored Division from the time just prior to its commitment in the Ardennes Counteroffensive to the end of the battle, in order to give an example of the operation of American armor in the historic struggle. For armor, in this battle, was subjected to one of its severest tests. Operating under almost impossible conditions, in snow, ice and sleet, through rough, heavily wooded terrain, over roads covered with ice and in weather that precluded air support in most instances, armor, working in close cooperation and coordination with infantry and other arms, contributed heavily to the successful elimination of the German threat; in spite of the fact that armor is by its very nature extremely sensitive to terrain and weather.

When Von Rundstedt launched his counteroffensive on December 16, the 2d Armored Division had completed a bitterly fought drive from the Siegfried Line to the Roer River, and was holding a defensive line along the banks of that stream. Preparations were being made for an attack across the river and on to the Rhine. The weather was bitterly cold, and although no snow had fallen as yet, a penetrating, continuous rain had turned the flat, open plain bordering the river into a quagmire which made movement off roads almost an impossibility. The tanks were dug in along the available commanding terrain bordering the river, and in exposed positions, as they almost all were, the crews could leave the protection of their armor only under the cover of darkness.

The infantry fared even worse, in foxholes half-filled with mud and water, which they dared not leave except when necessary to their mission. At night, the tanks were pulled back, to avoid being ambushed by "bazooka patrols" which the Germans sent across the river, and for maintenance and rest. Just before daybreak, they again moved into their prepared positions. At night, also, hot food and ammunition were brought up for the infantry, and necessary reliefs of units and personnel were accomplished.

To this depressing routine, which was in its third week when the German counteroffensive started, was added a growing realization of the probable cost of the projected attack across the Roer. Intelligence revealed a steady buildup of enemy forces on the east bank of the river. By the second week in December, it was known that the bulk of the Sixth SS Panzer Army was in the area which centered between the Roer River and Cologne. One division of that army, the 12th SS, was in fact bivouacked in the Hambach Forest, which lay just across the river from the 2d Armored's sector. Its position, as well as that of the rest of the army, was ideally suited to counter any offensive launched across the Roer. Additionally, several divisions which later appeared with the German Fifth Panzer Army in the counteroffensive were known to be out of contact and in reserve behind the German line.

Faced with this formidable array of power, the Division plans for the coming attack were drawn up with even more than the usual exactitude and care. That the German divisions could be used in a counteroffensive was a possibility, but the sensitive spot so far as the Division was concerned was the north flank. The XIX Corps, of which the Division was a part, held a sector between the Wurm River to the west and Roer River to the east. These rivers had their confluence some miles to the north, and on the east bank of the Wurm, in the peninsula thus formed, lay the Siegfried Line, with Aachen as an anchor near the southern boundary of the Corps sector. Thus the enemy could thrust south along the east bank of the Wurm with his right flank protected by that stream, pinch off the salient held by the XIX Corps, retake Aachen, reoccupy the Siegfried Line, and threaten the entire Ninth Army.

Move To The Ardennes

This threat was the immediate concern of the Division when the counteroffensive was launched on December 16. Intensive measures were taken to guard against parachutists and saboteurs, a task force was kept on the alert within the Division area, and a tank company was sent to augment the armored reserve at the Corps Headquarters. On December 20 the Division was relieved of its defensive sector, assembled in the area east of the Wurm River, and placed in Ninth Army reserve. That night one combat command, CCA, was moved to the west bank of the Wurm, where it would be more favorably placed to counter any drive by the Germans from the north.

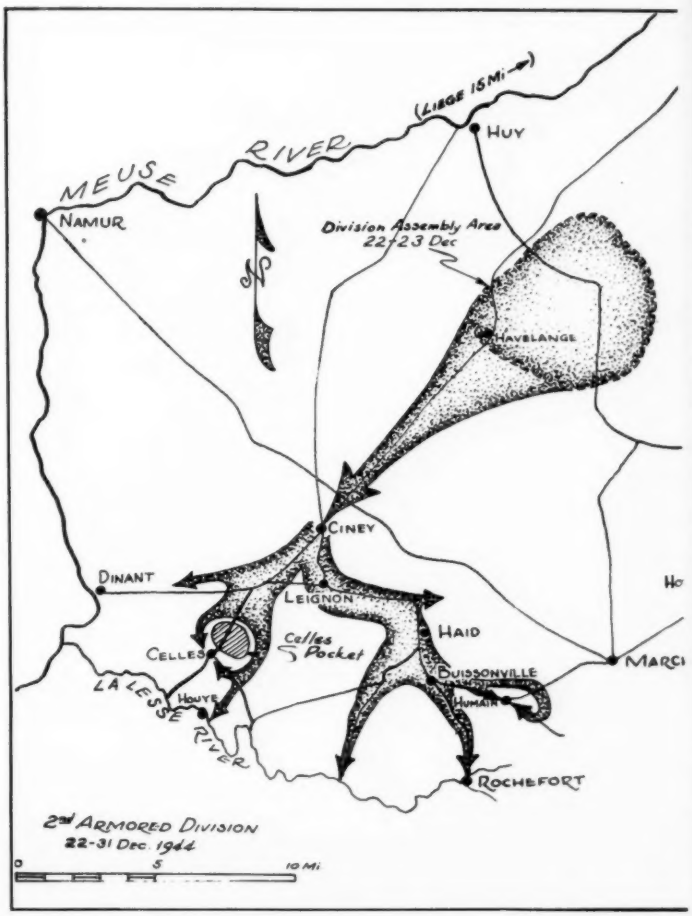
The planned attack across the Roer River had of course been postponed as soon as the seriousness of the German offensive was apparent, and as it developed the Division made preparations for a possible move to

the south. These preparations were not unwarranted, for during the afternoon of December 21 an order was received transferring the Division to the First Army, which was on the north flank of Von Rundstedt's penetration. This order was quickly followed by another, at about eight o'clock that night, directing the Division to move immediately to an assembly area in the vicinity of Huy, Belgium, just northwest of the point that the enemy attack had then reached, and prepare to counterattack to the south or southeast. By 11 o'clock the same night, just three hours after the order had been received, the leading elements of the Division were on the road and moving toward the battle.

The move was made under the most adverse conditions imaginable. No previous indication of the exact location of the Division assembly area had been available, and therefore no advance route reconnaissance was possible. In addition, the convoys moved under complete blackout restrictions, over narrow roads treacherous with ice and mud and clogged with traffic. The route lay through Aachen, now a heap of rubble due to the resistance put up by the Germans prior to its capture, thence south and west through hilly, wooded country, past Liege and the buzz bombs overhead, and into the assembly area which lay in the bend of the Meuse at Namur, just 10 miles south of the town of Huy. The Division moved in two columns, and by dark of the 22d was completely closed in its new area. The march had covered 70 miles, and despite the difficult conditions, had been without incident, except for several mishaps to vehicles due to slipping off the road on iced turns and grades. To understand this accomplishment it is necessary to consider the size and bulk of the unit. The Division was one of the two remaining American armored divisions still organized under the old tables of organization, which were heavier in personnel and equipment than the new, and so with its attachments consisted of over 14,000 men and approximately 3,000 vehicles, of which over 450 were tanks, tank destroyers and self-propelled artillery pieces. To move this mass of men and equipment quickly is difficult under even the best conditions, and under the conditions of the march into Belgium it required a monumental effort on the part of every individual in the division.

When the Division closed in its assembly area late on December 22, the point of the enemy advance was just 20 miles from the Meuse, and about the same distance southeast of the Division command post, set up in a château near Havelange. The German Sixth Panzer Army, in the northern sector of the offensive, had suffered several setbacks in its timetable to the Meuse, and was even then fighting to break through the stubborn northern shoulder of the bulge in the vicinity of Malmedy, scene of the infamous massacre of American troops earlier in the battle. The Fifth Panzer Army, in the southern sector, had met with more success, although it had failed to take Bastogne. The town was surrounded by the 26th Volksgrenadier Division, which had orders to take it while the Panzer Lehr and the 2d Panzer Divisions raced by on the south and north on their way to the Meuse. The northern of these two divisions, the 2d Panzer, now found itself the spearhead of the offensive, having outstripped all of the other German units in the Bulge. Moving parallel to the Sixth Panzer Army and just south of it, the 2d Panzer avoided the pitched battle in which the northern army was engaged in the vicinity of Hotton and Marche. Once clear of this area, it would be able to turn north and race for the Meuse between Namur and Dinant, or perhaps force a crossing further north.

These facts, unfortunately, were unknown to the 2d Armored Division as it moved into its assembly area. Exact positions of even friendly troops were sometimes unknown, and this was true to a greater extent of the locations of German units in the area of the penetration. The fight then going on to the east, where the Sixth Panzer Army was attempting to push north, had of course been reported, but the proximity of the 2d Panzer Division and its threat to the Meuse and to the assembling VII Corps had not. This was due primarily to the weather, which was so overcast that it precluded all aerial reconnaissance. It was not until two days later that the weather cleared sufficiently to allow either the artillery observation planes or the Air Corps to take to the air.



Under these uncertain conditions, the first move of the Division, once it had closed in its area, was to secure that area from possible enemy action, and to contact friendly units to the front and flanks. Both combat commands, the reconnaissance battalion, and the engineer battalion were therefore ordered to send out patrols to the south, east and west, each in their respective sectors. These patrols had orders to probe their assigned areas for possible enemy movement to the north or west, and to establish contact with friendly units which might be in these areas. All patrols were assigned limiting lines to insure that the presence of the Division in the area would not be compromised, insofar as this was consistent with the safety of the unit from surprise. In addition, all of the Division units set up and manned road blocks on all roads in the area.

Behind this screen of reconnaissance and road blocks, the Division staff began planning for the VII Corps attack. Even at this early date, the morning of December 23, plans for the attack had to be changed somewhat, due to the fact that one of the divisions of the corps was already in contact. The Sixth Panzer Army, in its headlong race, had run into the 3d Armored Division, also part of the First U.S. Army, in the vicinity of Hotton. Unable to penetrate in this area, it had slipped south, then resumed its march to the west, directly into the assembly area of the 84th Infantry Division in the vicinity of Marche. The 84th, therefore, was engaged in a pitched battle on December 23 to defend its area from the advancing enemy. It was hoped, however, that the attack could still be made, and plans therefore went forward during the morning.

Commitment

These plans were brought to a dramatic halt at 12:30 P.M., when a lieutenant from the reconnaissance battalion of the division arrived at the command post in a jeep. He was brought into the war room, where the commanding general and his staff were engaged in outlining plans for the Division attack, and there reported that he had been in command of one of the reconnaissance patrols which had been sent to the south of the Division area. When his patrol reached Haid, at 11:30 A.M., he announced, it had been fired on by a group of enemy vehicles which included two Mark IV tanks, and one of his armored cars had been hit and destroyed. Although the crew had escaped, identification was still possible through the markings on the vehicle. A quick glance at the map placed Haid just 10 miles south of the Division assembly area. The inference was obvious. The German spearhead, sideslipping the fight at Marche, had turned north again and was once more on its way to the Meuse. The situation was extremely critical. Haid was only 12 miles from Dinant, on the Meuse, and 20 from Namur. The enemy spearhead was even then threatening the rear of the 84th Division, fighting near Marche, and any further northward movement would place it between the 2d Armored and the Meuse, and threaten the line of that river from Dinant north.

Although the Division had been under orders to assemble out of contact with the enemy, it was obvious that the enemy now knew that at least the reconnaissance elements of the Division were in the area. In addition, it was imperative that the gap between the Division and the Meuse be closed at once, and the enemy prevented from advancing further north. The decision was not long in coming. Combat Command A was ordered to move at once to Ciney, four miles northwest of Haid and squarely in the middle of the gap between the 84th Division and the Meuse, to secure Ciney and clear the area south of the town of enemy. But this was not enough. Contact had been made at 11:30 A.M., and it was now after 1 P.M. In that short time an aggressive enemy might have made his way through Ciney and the thin reconnaissance screen into the area in the bend of the Meuse. One of the medium tank companies from the armored regiment assigned to CCA was bivouacked in a patch of woods less than 100 yards from the command post. It had arrived the night before after the gruelling march from the Roer, and was now resting and reconditioning its vehicles and tanks, preparing for further action. But it could not realize how close that action was. A staff officer hurried from the château to the woods, and in less than 10 minutes a column of tanks and half tracks streamed out of the woods and down the road to Ciney, throttles wide open. CCA had been committed to action.

When the tanks reached Ciney, however, they found it clear of enemy. After the first contact at Haid, the German column was evidently proceeding slowly and with caution, for the distance from Haid to Ciney was only four miles, while that from the division command post to Ciney was 10. The tank company quickly outposted the southern edge of the town, and as the remainder of the combat command closed behind it, the town was occupied and the surrounding terrain organized for defense. This was a definite block in the path of the advancing enemy, for Ciney was the focus of the road net between Marche and the Meuse, and its denial to the enemy would at least hinder and perhaps block his march northward.

The occupation of Ciney, however, accomplished only part of CCA's mission. No contact had yet been made with the enemy, and it was possible that he was now marching on Dinant, hoping to cross the river at that point. An attack on Buissonville, which lay six miles southeast of Ciney, was therefore ordered. This would strike the Germans in the flank, if they were marching to the west; if they were still advancing north it would lead to a meeting engagement. In order to resolve the situation as quickly as possible, a night attack was ordered, and the task forces of the combat command began moving down the road to Buissonville at 8:30 P.M., just after dark. At the same time, other elements of the combat command protected Ciney and reconnoitered to Namur and Dinant, to guard against penetration in these areas. Very little snow had fallen,

and as the weather had begun to lift in the afternoon, the night was clear and sharp with cold.

As the advance guard of the leading task force reached Leignon, about three miles from Ciney, it was fired on by an antitank gun and machine guns, marking the first enemy contact for the combat command. Support was quickly brought up, and the antitank gun and two enemy half tracks were destroyed by accurate fire, without loss to the task force. Leignon was occupied, and the advance resumed. The night had become very dark, and the advance was slow and cautious. In addition, some reorganization had been necessary after the skirmish at Leignon. As a result, the advance guard was still some distance from Haid at two o'clock on Christmas Eve morning. About 15 minutes later the leading elements reported noise and movement approaching on the road ahead. The column was halted and reconnaissance patrols quickly sent out. They returned in a short time and reported that a column of German vehicles and tanks was advancing slowly up the road. The enemy column had evidently halted after its contact with the reconnaissance patrol the previous morning, and was only now beginning to move again. It was evidently, also, not aware that American troops were ahead of it.

The commander of the CCA task force quickly saw the opportunity for something very rare in modern combat—an armored ambush, and as quickly seized it. Tanks, half tracks and the other vehicles of the task force immediately moved off the road to either side, taking up positions, as quietly as possible, which commanded the road, and leaving it deserted. The noise which this made was evidently not audible to the Germans in the noise of their own column, for they continued to move cautiously up the road, between the quiet and watchful ranks of tankers, machine gunners and riflemen.

As the leading vehicle reached the far end of the task force, a gun opened up. Immediately the scene was illuminated by gun flashes, tracers and shell bursts, as cannon, mortar, rifle and machine-gun fire poured an ever-increasing volume into the hopelessly enmeshed column from both sides of the road. In a short time a vehicle near the head of the column was afire. Then another blazed up, and in a very few minutes the road was bright with the blaze of burning vehicles. By this light the slaughter continued, the task force moving in as resistance decreased, until the entire column was destroyed except for scattered vehicles and enemy which escaped in the confusion of the fight. The losses in CCA were negligible, due to the element of surprise and the force of the attack. It was now after 4 A.M., and CCA coiled up near the road to reorganize and await daylight. At 8:30 A.M. the advance was resumed. Since contact was obviously again imminent, the combat command advanced in three columns, all moving close together, both on available roads and cross country. Haid was cleared at 9:15 A.M., and at 10:45 A.M. tank fire was received from the vicinity of Forzee, a small village a mile south of Haid. A fire fight ensued, and one enemy tank was knocked out, CCA suffering no losses. The attack was resumed at 1 P.M., and at 2:30 P.M., the combat command entered its objective, Buissonville. A task force swept the area northeast of the town and flushed out six tanks and several other vehicles, most of which were destroyed or captured. Buissonville itself was occupied and defensive positions prepared.

The occupation of Buissonville completed CCA's portion of the Division plan for the extension of the line Hotton-Marche, and it was to hold the town until further orders. Plans, however, were immediately made for an attack on Humain, an enemy strongpoint four miles to the southeast, since this would logically be the next objective if the attack was resumed.

It was known by this time that the enemy which CCA had defeated during its march to Buissonville belonged to the 2d Panzer Division, the spearhead of the German Fifth Panzer Army. It was an ironic twist of fate that the 2d Armored Division should be fighting its opposite number in the German Army. But not for the first time, however. The two units had met several times before, from the Normandy Beachhead on, and always with the same result. It remained to be seen whether this pattern would continue, under the conditions of the present engagement. Both were attacking, both a little removed from other supporting troops, both presumably in good condition, and both intent on the same objective—destroying the other and continuing the advance.

While this was going on, the remainder of the division had not been idle. On the 23d, CCB continued to maintain road blocks around the Division assembly area, and prepared for movement to the south, if this should be ordered. Early on the 24th, after CCA had cleared Ciney, CCB was ordered to secure the town, and relieve CCA elements there to rejoin their combat command. This CCB did with one of its task forces. Shortly thereafter, intelligence reported a buildup of enemy forces in the vicinity of Celles, and particularly in the woods east and north of the town. The enemy was again up to his old tricks. After the contact with CCA at Haid, he had evidently again sideslipped, at least with part of his force, and was once more headed north, this time within five miles of the Meuse. Why no attempt was made to cross the river in the vicinity of Dinant is not known, except for the fact that the German plans called for a crossing further north. Whatever the reason, it placed the spearhead of the enemy offensive squarely in the front of the 2d Armored.

Still under orders to secure the assembly area and prevent the enemy advance to the north, the Division commander ordered the 4th Cavalry Group, which had in the meantime been attached to the Division, to reconnoiter the gap between CCB and the river, establish contact with CCA to the southeast, and maintain contact between it and the 84th Division on the left. This was done, and resulted in several small actions in

which several enemy vehicles were destroyed. In addition, the 4th Cavalry Group contacted the British 29th Armored Brigade on the right, in the vicinity of Dinant.

Thus at dark on Christmas Eve the Division held a line which stretched from the 84th Division, still engaged at Marche, all the way to the British on the Meuse at Dinant. The situation had cleared tremendously, for now at least there was no gap between the American forces and the Meuse, and although exact locations of the enemy were unknown, it was reasonably certain that his armored spearhead would continue to attack to the north, probably in the vicinity of Celles. This situation was known to higher headquarters, where the necessity of immediately stopping the enemy attack was also well realized. With the major offensive element of the proposed corps attack already partly committed, and with no immediate prospect of its relief from the line, it was also obvious that the projected operation could not be quickly carried out. These considerations were all weighed, and at 11 P.M. on Christmas Eve an order was dispatched directing an attack by the 2d Armored Division on Christmas Day. The way was now open to crush the German spearhead and stop the offensive.

Christmas Day dawned bright, cold and clear, a Christmas present of the second of four days of good flying weather that was to help spell the doom of the Ardennes Counteroffensive. The two major commands of the Division, CCA and CCB, being separated by over 10 miles, launched their attacks independently, both under orders to destroy the enemy to their front and to close to the line of the La Lesse River, which flowed into the Meuse from the vicinity of Rochefort, 10 miles to the southeast. The Division reserve took up position behind the combat commands to support them, until it was committed with CCA two days later. The Division attack lasted three days, and the dawn of the fourth saw the German hopes of victory in the Ardennes thwarted.

The CCA Attack

CCA again attacked in darkness on Christmas morning, sending one troop of the 24th Cavalry Squadron, which had been attached to the command the day before, into Humain in an attempt to seize it in a quick thrust. However, at 7 A.M., a strong enemy force composed of tanks, infantry, and some artillery launched a counterattack from the southeast, and forced the troop to withdraw toward Buissonville. At 1 P.M. the troop made an attempt to retake the town, but was repulsed. At 4 P.M. the 24th Cavalry Squadron was reinforced by four platoons of tanks and one platoon of tank destroyers, and a third attack was made this time from the northeast and south. Resistance was determined and heavy, and the attack dragged on into darkness, when the attacking forces halted and consolidated their positions, extending around the town to the north, east and south and almost encircling it. During the night the Germans attempted to send a relieving column into the town, but were unsuccessful, losing several vehicles and a number of men in the attempt. From the prisoners taken, it was learned that they belonged to the 9th Panzer Division, ordered to go to the assistance of the 2d Panzer Division. It was learned later that the 130th Panzer Division had also been ordered to go to the assistance of the 2d Panzer, but arrived too late to do any good, either in this or the Celles area. The enemy plan of replenishing his fuel stocks from captured American dumps had not worked out successfully, and with fuel and other supplies running low, it was essential that the spearhead reach the Meuse immediately, or it would not be reached at all. Even now some tanks in the advance elements near Celles were out of gas and might have to be abandoned. In addition, the Allied Air Forces had seized on the favorable weather, and were pounding the German columns wherever they appeared in the area of the penetration. Things were beginning to look a little less bright for Hitler's hopes.

In the meantime, the remainder of CCA had launched two other attacks, at 9 A.M., with Rochefort and the high ground to the west as objectives. Both columns encountered strong enemy resistance, and at dark had advanced only about two miles.

During the day, the enemy had also launched several counterattacks against CCA in the vicinity of Buissonville, having by-passed partially encircled Humain to the east. These attacks were all repulsed with heavy loss to the enemy, and in one case a column of 14 enemy vehicles was trapped and completely destroyed. However, continued enemy attacks from the south were indicated, and the combat command was ordered to consolidate the line which it held, from Humain to the west, repulse any enemy attempts to move to the north, and to reorganize for a possible continuation of the attack on the 27th.

By the morning of the 26th the German elements which had filtered into the area north of Humain had been eliminated, and the combat command turned its attention to the south, bracing itself for the expected attacks. Nor was it disappointed. At 7:50 A.M., in the gray mist, a force of 15 tanks and a battalion of infantry threw itself against the CCA force, which consisted of a tank company, holding the village of Havrenne, a mile and a half below Buissonville. A bitter fight followed, the tankers using every gun in their arsenal against the enemy who continued to advance despite their heavy losses from the accurate American fire. The Germans pushed their attack to within 100 yards of the CCA position, and only then did the remnants begin to withdraw, leaving the field littered with tanks, vehicles and dead and wounded. Eight tanks, two half tracks, a self-propelled gun, and numerous dead were counted in the open fields across which the attack had been made. The CCA tank company suffered damage to two tanks and several men wounded.

Another attack was launched against the same force at 8:30 A.M., shortly after the first had been repulsed. This one however, was not pushed with the same determination as the first, possibly because of the mauling which the latter had received. As a result, when the leading three half tracks in the enemy force were destroyed by accurate tank fire, the attackers withdrew. At the same time, yet a third attack was launched, against the extreme right flank of the CCA position four miles southwest of Haid. It met the same fate as the other two, and ended the counterattacks against the CCA line on the 26th.

Capture of Humain

During the following night, and after reorganization, plans were made for pushing the CCA attack to the line of the La Lesse River, and for the capture of Humain. For this latter task, the Division reserve was attached to the combat command, and moved during the night to join it. The two CCA columns to the west of Humain jumped off just after noon of the 27th, and, moving against scattered but determined resistance, reached their objectives, both along the La Lesse River from Rochefort west, at 6 P.M. A task force contacted CCB, operating in the area around Celles, and on the left the combat command closed around Rochefort, which was tenaciously defended. This resistance was overcome as darkness fell, and the enemy pulled back to the south bank of the river.

The attack on Humain, on the same day, was preceded by artillery fire on strong points in the town throughout the night, and a one-hour artillery preparation from 7 to 8 A.M. At 8 A.M. the attack jumped off, one tank company taking position on the west edge of town to assist by fire the attack of the remainder of the force. A task force of tanks and infantry was sent around the town and attacked from the south, while a battalion of infantry attacked from the north. The town was defended by a battalion of the 9th Panzer Division with some tanks and scattered detachments of the 2d Panzer in support. This force fought stubbornly, barricading themselves in houses and fighting until killed or forced to move to another house. As a result, very few prisoners were taken in the early part of the fight for the town. The artillery fire had provided abundant rubble that afforded the defenders cover and impeded the movement of the attacking tanks and infantry. The fight went on all day, with the enemy gradually giving ground, until just after dark the few remaining Germans were surrounded in a large, thick-walled stone château on the edge of town. Still they refused to surrender. Then a tank from the Fife and Forfar Yeomanry, a British squadron of flame throwing tanks which had been attached to the Division for some time, was brought up. Instead of attacking the château, it advanced into the open and threw its stream of flame into a large tree which stood in full view of the enemy defending the château. In minutes the tree was a pillar of fire, lighting up the surrounding buildings and the courtyard of the château. The spectacle had an immediate effect, for in a few minutes the last defenders of Humain filed out of the château, hands above their heads. Except for mopping up operations in rear areas, this action concluded CCA's mission, and it began organizing the line which it held, from southwest of Marche along the La Lesse River to a junction with CCB southeast of Celles.

The CCB Attack

While CCA was thus fighting its way to the La Lesse River, CCB, on the right, was engaged in a similar attack, which was to end in the almost complete destruction of the enemy spearhead. This drive was aimed from the start at the large enemy buildup in the Celles area which intelligence reports had indicated. Jumping off from Ciney at 8 A.M. on Christmas Day, CCB advanced in two columns, one moving to the southeast of Celles, and one to the north, the object being to surround Celles and the woods to the north and east in which the German units were located. The north column advanced steadily against light resistance, and by 5 P.M. had reached its objective, the woods just northwest of Celles. The south column advanced quickly through the broken country east of Celles against similar resistance, then swung around to the west and then to the northwest, to reach the high ground southeast of Celles just as the northern force reached its objective. Then the two forces made a combined attack on Celles. Resistance was heavy, but by 5:45 the town was cleared and the two forces had joined, completing the encirclement of the numerous enemy trapped in the woods to the north and east.

Meanwhile, other elements of the combat command had been active to the north and south. Strong reconnaissance patrols had been sent out to the south in the morning, and had knocked out seven enemy vehicles attempting to advance north near the bridge over the La Lesse River southeast of Celles. These patrols continued to operate in the area between Celles and the La Lesse River, protecting the flank of the combat command and maintaining contact with CCA to the east, for the next three days. At noon the combat command artillery engaged an enemy column which had been discovered on the road north of Celles, and knocked out seven tanks and 10 other vehicles. The Division reconnaissance battalion, which had been attached to the combat command for the operation, and which was covering the north and west flanks of the attack, cleaned enemy pockets from two small towns north of Celles, capturing or destroying, in the process, 20 enemy vehicles and numerous personnel. This was one of the instances in which units of the Division encountered the German "Trojan Horse" ruse, for out of the 20 vehicles captured or destroyed, seven were American. Although the crews in this instance were in German uniform, extreme care was necessary to avoid firing on friendly units. This situation added considerably to the difficulty of the operation, since all

vehicles were suspect until they were identified, even though they were recognized as American. The reconnaissance battalion also maintained contact with the British at Dinant. The British 29th Armored Brigade, part of the force holding the line of the west bank of the Meuse, had moved part of its tanks and troops to the east bank, and had established a command post in Dinant. This force rendered considerable assistance to CCB, in covering its open flank on the river as it advanced and providing supporting artillery fire.

The Celles Pocket

During the night of the 25th-26th the combat command reorganized, and at 9 A.M. on the 26th attacked to begin the reduction of the Celles pocket. Three task forces converged on the trapped Germans, and although resistance was heavy, especially in the northern portion of the encirclement, steady progress was made, and by nightfall only one small group of enemy remained, in a patch of woods just east of Celles. At 4:50 A.M. the next morning, the enemy force in this circle launched a counterattack in the darkness in an effort to escape. It was quickly repulsed, and 50 of the enemy were captured. Then, at 10 A.M., CCB launched its attack; progress was slow due to the stubborn enemy resistance and the heavy undergrowth, and it was not until 11:30 A.M. that the woods were clear, numerous additional prisoners and 80 vehicles, several of them American, being taken. The action throughout the reduction of the Celles pocket was characterized by the stubborn enemy resistance, evidenced by the small ratio of prisoners to killed, and by the slow progress on the part of CCB, imposed by the heavily wooded area. The initial attack on the 26th was preceded by an artillery preparation fired by all available artillery, including the British artillery east of the Meuse, for five minutes. Then the infantry advanced, supported by tanks firing canister. Each dug-in position had to be individually reduced, and each suspicious spot received its quota of fire. This method of operation was followed throughout the two days of the action, and helped to reduce the number of American casualties, these being extremely light compared to the number of enemy killed, wounded and taken prisoner. Although many of the German vehicles were by this time out of gasoline, and immovable, they were used wherever possible as stationary pillboxes, and normally formed the nucleus of a strong point. These were particularly troublesome, and were reduced only after bitter fighting.

Although the German troops in the pocket were hopelessly surrounded, the enemy continued his efforts to relieve them until the afternoon of the 26th. The enemy column attempting to cross the La Lesse River south of Celles, encountered by the Division reconnaissance patrol on the 25th, was one of these, with two more attempts on the 26th. The first of these latter was launched by a force of enemy infantry at 12:15 P.M., from the bridge over the La Lesse River southeast of Celles up the road towards the town. It pushed up a short distance, and then was crushed by fire from a tank battalion, and the enemy withdrew. Shortly thereafter, the second enemy attack was launched from the same spot as the first, this time by a powerful tank-infantry team. It was momentarily stopped by fire from the tank battalion and the combat command artillery, but collected itself and again began pushing towards Celles. The commander of the combat command knew that if the tanks accompanying the attack could be knocked out, the enemy would withdraw. Dive bombing was the answer, since the heavy Mark V and Mark VI tanks being used by the Germans were little affected by the fire of the American tanks. But the air support which the Division received during the action was intermittent, due to the distance that the fighters operated from their bases, and no planes were available at the time.

The British on the Meuse, however, had rocket firing Typhoons, which had in the past proven themselves extremely effective against tanks. The combat command commander therefore hurried to the British command post. The British were willing and anxious to cooperate, but another difficulty presented itself. The Division had no radio capable of communicating with the planes, to guide them in to the target. But the combat command artillery observation cubs were up, and intimately familiar with the location of the targets. Why not use one of them to guide the British planes in? Radio commands issued from both the British and the American command posts, and in a short time a squadron of Typhoons appeared, circling above a lone cub which dived on a number of tanks advancing up the road towards Celles. Then the cub turned towards its own lines, and the Typhoons screamed down, rockets lancing from their wing runners. In a short time seven German tanks were out, and the rest of the attacking force began to pull back, with the Division tanks and infantry pushing them hard. This attack ended all enemy attempts to relieve the trapped units at Celles, and all attempts to push to the north.

The afternoon of the 27th was spent in cleaning up the reduced pocket and the combat command rear areas, and collecting prisoners and wounded. Only part of the command was used in this task. The remainder pushed south again, launching an attack which took the high ground south of Celles and overlooking the La Lesse River, and closing to the river throughout the breadth of the combat command zone. Thus, at dark on December 27, the Division held a continuous line along the La Lesse, from Houye, where contact had been established with the British on the right, to some distance east of Rochefort. On this line the Division was ordered to halt, organize the ground, and await further orders.

Relief

Early on the 28th, the Division was relieved of its mission and ordered to assemble the bulk of its force

in the area it had occupied on the 23d, its line to be turned over to the British, the 4th Cavalry Group and the 83d Infantry Division. The Division reconnaissance battalion and several companies of tanks remained in the area, patrolling the river and maintaining road blocks until the relieving units came up. During the next two days these units gradually moved into the Division assembly area as they were relieved, and by December 30 the Division was completely assembled. Plans were prepared and road blocks set up against the possibility of an enemy airborne attack or ground infiltration. All units were intensively occupied in maintenance, repairing the damage done during the five-day action. But there was still time for a well deserved rest, for the distribution of mail and Christmas packages, and for the long delayed Christmas dinner.

This leisure also gave time for contemplation of the division's accomplishments, for which recognition was not long in coming. The following are extracts from the comments on the action that appeared in the VII Corps Weekly Intelligence Review, December 31, 1944:

"From the beginning of the enemy's drive on December 16 he had forged ahead with varying degrees of speed . . . he moved west while shooting other columns northwest . . .

"Realizing he must not stop at any point, he continued with ever-increasing speed toward the west, hoping to reach the Meuse River and turn north toward Liege. By midnight of December 22 . . . strong patrols had reached Celles . . . reconnaissance elements were reported west of Celles and north of Ciney. He was well entrenched and strong in Rochefort.

". . . the attack of December 23 of Second Armored Division may well be remembered as having one of the most far reaching effects of any action of World War II, for the masterful execution of this attack by the 2d 'Hell on Wheels' Armored Division not only stopped the German 2d Panzer Division long before it could reach Namur, but annihilated a great part of it and forced the remnants to withdraw from Celles, Leignon, Buissonville, and Humain toward Rochefort, thus bringing to a halt the greatest sustained German counter drive against Allied troops on the Continent since D-Day.

"The meeting of the U.S. 2d Armored Division and the German 2d Panzer Division was a fitting comparison of the Allied and German armored might. Each was an able representative of the Armored Division of its army. For three days the engagement continued, involving hundreds of small battles. By December 25 the German onslaught began to falter, stopped and gradually withdrew, losing heavily in men and material. . . . It is estimated the Division (German 2d Panzer) strength just before this four-day period was approximately 8000 men and 100 tanks. . . ."

Additional recognition came in the form of the letter of commendation from the Commanding General, First U. S. Army, to which Marshal Montgomery added his congratulations, a copy of which is reproduced elsewhere in these pages.

Realization of the magnitude of its accomplishment grew as the Division made a preliminary count of the battlefields: 1200 prisoners taken; more than 550 enemy dead; 81 tanks, 167 trucks, 74 guns, 111 half tracks, seven self-propelled guns, and 154 other vehicles of all types captured or destroyed, 24 of these being American. This in contrast to the Division losses; 220 wounded and less than half that number killed. The loss to the Division in tanks and other vehicles was insignificant in comparison to the number captured.

These statistics attested the overwhelming defeat of the German spearhead by the Division. But even more they marked the end of German offensive power in the Bulge. As the Division rested it could look back on a job well begun, but not yet completed. For the salient still existed, and must be reduced. And so as the year ended, plans were being laid for this next operation.

Second Armored Division
Troop List December 23, 1944
Commanded by Major General Ernest N. Harmon

Artillery Commander—Col. C. I. Hutton
Chief of Staff—Col. C. S. Mansfield
AC of S G-1—Lt. Col. C. S. Hannum
AC of S G-2—Lt. Col. E. A. Trahan
AC of S G-3—Lt. Col. R. W. Jenna
AC of S G-4—Lt. Col. C. C. Petersen
Div Engr—Lt. Col. L. W. Correll
702d TD Bn—Lt. Col. J. A. Beall
195th AAA Bn—Lt. Col. D. R. Corum

Combat Command A—Commanded by Brigadier General John H. Collier

Task Force A Lt. Col. H. O'Farrell
3d Bn 66th AR (less Co 1)
1st Bn 335th Inf Regt
1 Plat Co A, 702d Td Bn (SP)
1 Plat Co A, 17th Armd Engr Bn

Task Force C Col. H. C. Parker
335th Inf Regt (less 1st and 3d Bns)
1st Bn 66th AR (less Rcn Co) Cos F and I, 66th AR atchd
1 Plat Co A, 702d TD Bn (SP)

CC A Control
Hq CC A
Artillery
14th Armd FA Bn (w/1st Plat Btry D, 195th AAA Bn)
92d Armd FA Bn (w/2d Plat Btry C, 195 AAA Bn)

Task Force B Col. W. H. Stokes
66th AR (less 1st Bn, 3d Bn, Co F, Rcn and Maint Cos)
3d Bn 335th Inf Regt
1 Plat Co A, 17th Armd Engr Bn
1 Plat Co A, 702d TD Bn (SP)

Task Force D Lt. Col. W. G. Merriam
82d Armd Rcn Bn (less Co B, 1 Plat Co A and 1 Plat Co D)
Co A, 17th Armd Engr Bn (less 2 Plats)
Co A 702d TD Bn (SP) (less 3 Plats)
Maint Co 66th AR (w/det Maint Bn 2d Armd Div)
Co A, 48th Armd Med Bn

Combat Command B—Commanded by Brigadier General I. D. White

Task Force X Lt. Col. H. L. Hillyard
Hq 67th AR
1st Bn 67th AR (Cos A, D and I)
1st Bn 41st AIR
1 Plat Co C, 702d TD Bn (SP)
1 Plat Co B, 17th Armd Engr Bn
78th Armd FA Bn (Btry A, 195th AAA Bn atchd) direct support

CC B Control
Rcn Co 67th AR
Co B, 17th Armd Engr Bn (less 2 Plats)
Co C, 702d TD Bn (SP) (less 2 Plats)
Co B, 82d Armd Rcn Bn

Task Force Y Lt. Col. C. J. Batchelder
3d Bn 67th AR (Cos C, G and H)
3d Bn 41st AIR
1 Plat Co C, 702d TD Bn (SP)
1 Plat Co B, 17th Armd Engr Bn

CC B Trains
Maint Co 67th AR
Co B, 48th Armd Med Bn
"A" Trains, CC "B"

(To be concluded)

Southern France Exploits of

Task Force Butler

by Brigadier General Frederic B. Butler

PART I

This is the first of two articles on the operations of a Provisional Armored and Mechanized Cavalry Unit in exploiting the invasion of Southern France. Through the valuable medium of personal experience we mold our basis for improvement of our Army of the future. We have some interesting reading to boot.

(**Introductory Note:** On August 15, 1944 the U.S. Seventh Army landed on the coast of southern France in the area between Toulon and Cannes. The U.S. VI Corps, commanded by Lieutenant General Lucian K. Truscott, made the initial assault at 8 A.M., with the 3d Infantry Division on the left in the St. Tropez area, the 36th Infantry Division on the right in the Frejus area, and the 45th Infantry Division in the center near St. Maxime. Already a Provisional Airborne Division had been dropped several miles inland and was cutting the German communications with the beach area. The highly successful landings were followed by an immediate consolidation of the beachhead, movement west by the 3d Division to isolate Toulon and Marseille, east by the 36th Division to the Italian border, while the 45th Division made contact with the airborne troops and drove northward in the center. Following the American units over the beaches on D + 1 the French II Corps consisting of two infantry, one motorized and armored divisions landed in support of the U.S. VI Corps. According to the plan the French were earmarked for the assault on the ports of Toulon and Marseille; the rapid advance of the Americans during the first two days made this assault imminent. The release of the French stripped VI Corps of its only armored division and caused the Corps Commander to bring into being as planned a provisional armored group composed of corps armored units under the command of the Assistant to the Corps Commander, Brigadier General Frederic B. Butler. This article is General Butler's personal memoir of the operations of the task force that was to bear his name. General Butler served as Assistant Division Commander, 34th Infantry Division, and Assistant to the Corps Commander, VI Corps. He is now Sixth Army Engineer.

This account of his experiences was written from memory while he was crossing the Pacific in 1946. The undersigned as a member of the Army Historical Division borrowed the manuscript for research and secured General Butler's permission to edit and publish it.—**Major James D. T. Hamilton.**)

THE troop list as constituted for the American VI Corps for the invasion of Southern France included as floating reserve a combat command of a French Armored Division. At a staff meeting less than a week prior to the Corps loading out from the Naples area for the invasion, General Lucian K. Truscott, the Corps Commander, announced that he feared the French armor would be taken from him and returned to French control shortly after landing. Such a move, he said, would leave him without a force capable of exploiting a success. In order to overcome this deficiency, he announced that he planned to constitute a Provisional Armored Group from elements of the Corps. Turning towards me, he added, "And if there is such a force, you will command it." He then directed that I prepare a tentative organization, building it around the Corps reconnaissance squadron, the 117th Cavalry Reconnaissance Squadron (Mecz). I was then serving in the capacity of Assistant to the Corps Commander.

After the conference, a detailed conversation developed the possible missions of the force. Most probable, and the one for which the Force was designed, was to sweep to the north towards Lyon, proceeding initially to Sisteron on the Durance River and from thence to be prepared to turn west or to continue northward.

Time was short. My first step was to select a staff from amongst assistants in the various Corps staff sections. Next, a provisional troop list was prepared. Then as the staff was assembled, various studies were assigned—detailed map reconnaissances of routes, terrain appreciation, air-ground cooperation, Maquis liaison, and most pressing of all, a communications plan. I realized that the success of any such operation was tied to a successful communications plan.

In evolving a command and communications plan, I entertained two considerations, one to draw on the Corps Signal troops, the other to superimpose my headquarters on the Reconnaissance Squadron and develop my communications around its net. The former plan drew so heavily on Corps that I abandoned that plan and decided to build around the latter scheme. Commanders of all units were called in, the plan was explained, and communications officers were closeted with the Force Signal Officer. An SOI was produced and mimeographed.

The Force as approved consisted of the following:

117th Cavalry Reconnaissance Squadron
59th Armored Field Artillery Battalion
753d Tank Battalion (less one Medium and one Light Tank companies)
2d Battalion, 143d Infantry Regiment
Co. C, 636th Tank Destroyer Battalion
Co. F, 344th Engineer Regiment
Co. C, 111th Medical Battalion
Detachment, Co. D, 111th Medical Battalion
3426th Quartermaster Truck Company
Detachment, 87th Ordnance Company
Detachment Military Police (VI Corps)

Subsequent conferences were held with the Corps Commander and prior to sailing, the mission had narrowed to a single possibility, "To proceed to Sisteron and from there, be prepared to continue north to seize Grenoble or to turn west and seize the high ground north of Montelimar." All unit commanders involved were briefed on this, the selected route, and all pertinent details prior to departure from Naples. Division commanders were briefed and the whole plan was approved by Lieutenant General Alexander M. Patch, Commanding General, Seventh Army.

As indicated, the Provisional Armored Group, subsequently to be dubbed by the correspondents "Task Force Butler," was nothing more than a plan. Late in the afternoon of August 16, after the 45th Division had made physical contact with the Airborne Division in and around LeMuy, General Truscott ordered the Force to assemble during the day of August 17, prepared to pass through the 36th Division at daylight of the following day. The prepared plan went into effect and the assembly proceeded without incident except that Corps G-4 and the Corps Engineer between them could not mobilize the Engineer Company, a unit that had never smelled powder.

Late in the afternoon of the 17th, Truscott issued his oral order to me. Sisteron remained the objective. After some discussion on the subject, I was permitted my choice of routes. Back in Naples, I had tentatively selected the Route Napoleon, which runs from Nice northwest to Digne, then north through Sisteron and Gap to Grenoble, for the route of advance. It had appeared to be the more direct and had the advantage of a protected right flank—Switzerland and the mountains. Every effort was made to secure road data, maps were studied and terrain appreciations prepared. Prior to leaving Naples, I made the decision, however, to direct the main effort of the Force not along the Route Napoleon but along the roads running eastward from Draguignan to Salernes, Riez, north to Oraison and Sisteron. Careful study of the Route Napoleon indicated the terrain so mountainous that a small enemy force with a single self-propelled gun could have made this "cavalry sweep" just another crawling Italian campaign. Developments proved the choice made in Naples to have been a sound one, and if one needs an object lesson on the value of terrain appreciation, no better incident than this need be cited.

Asked for an estimate of time necessary to reach Sisteron, the Group Commander stated three days for sure, possibly two days. Further questioning by General Truscott, who seemed a bit incredulous, guaranteed him Riez, 45 miles from Draguignan, as the objective for the first night.

As soon as commanders could be assembled in the bivouac north of LeMuy, the situation was reviewed, the order was issued. The importance of initiative was stressed. All possible liaison was established with the

36th Division to assure a smooth passage through the outposts to the north and east. Daylight of the 18th was set for the passage of lines.

The column started before daylight next day, August 18. A reinforced troop of the Reconnaissance Squadron was sent north through Draguignan with instructions to proceed toward North Castellane and develop the enemy situation. This troop, the first scheduled to start, cleared Draguignan without delay and left the routes clear for the main body. The 36th Division had outposted the town the day before. Having watched the efforts of the 142d Infantry the previous day to break through the north portion of the town's outskirts fail, I was prepared to hear of early trouble from this direction.

Remaining elements cleared their bivouacs on schedule and the main column appeared to be rolling. No report came over the command net and as I bowled along a clear road to catch the advance guard of the column, the sun rose and this seemed, after all, to be the sort of expedition we wanted it to be—a rat race.

Joy was short-lived. On the western outskirts of Draguignan I began to run into a stalled column. What was the difficulty? The commanding officer of the Reconnaissance Squadron, Lieutenant Colonel Charles J. Hodge, was soon found in his radio command car. The point was held up at the first bridge out of town. The outposting troops had set up a road block at the bridge, and this little obstruction had to be removed before the "charging" troops could advance! And what a block it was! It took a half hour's feverish work to clear a lane. The 36th did not take a chance. The banshee itself (were we in Ireland) could not have come in to disturb the sleep of the lads from Texas. As minutes passed and as good time slipped by, I became concerned and went to the bridge myself, and with my own eyes saw the *friendly* obstacle that held up our progress. There must have been two hundred pounds of TNT in that little bridge—not to mention antitank mines, posts, rails, boulders, and cable! Oh, it was a masterpiece but very disconcerting in the early morning—under the circumstances, and especially after precaution had been taken to post the 36th Division on the plan and ask their cooperation in clearing our columns through the outposts. But those things happen even in a well-ordered war.

I remained on the scene, fuming, fretting, and beleaguering, until I saw the lead vehicle underway. I then got off the road to check the column past and join my squadron leader at his radio car—the nerve center of the whole command—as it came along. But soon vehicles ceased to move. I hurried back to the unfortunate colonel's scout car and very quickly and pointedly brought up the question of the stalled column. "But the column is moving, Sir." Well, I knew more of the movement—and lack of it—than the radio had disclosed to the CP.

"What of Troop C—the flank column?"

"Sir, they report their head clear of the outpost but held up by AT fire. They are sending out dismounted patrols and placing the attached guns in position."

Well, I hadn't expected much progress from that element but was concerned over the slowness of the main column. We needed progress to get at the subsidiary roads ahead of us so that the Reconnaissance Squadron could fan out. Then we would make better time. Also, it was necessary to clear a certain road junction north of Draguignan by 8:30 A.M. A regiment of the 45th Division was to follow us and I guaranteed General Truscott that, barring enemy action, this would be done.

Radio communication was perfect. The head of the column was moving again, but obviously with too much caution. My poor young colonel had a very trying quarter-of-an-hour while I stayed at his still stationary radio car. Leaving interim instructions with him, I made off to the head of the column to give the point commander a few simple fundamentals in methods of bold rapid advance. The 117th was a young unit, having had only limited experience in Italy and never confronted with a wide open situation like this offered to be.

Things began to move a bit better. I made my way back down into town once more. The squadron headquarters had advanced some but was stopped again. Once more I started for the head of the column. It had progressed not more than a mile when my attention was attracted by a madly careening screeching jeep coming up behind me. It was Hodge madly waving and shouting.

I stopped. He stopped. With the restraint and composure of a young actor, and making every effort to be military—but unconcerned—Hodge reported that Troop C on the right had broken through the resistance earlier reported, had taken prisoners and equipment, including one corps headquarters complete with one lieutenant general, his pistol, brandy and staff! The (German LXII) corps commander, Lieutenant General Ferdinand Neuling, was under escort back to the square in Draguignan to be held there for formal surrender to a general officer. Naturally there was no word as to the cache of brandy that had been taken!

This set up young Hodge. His troop really had done a job, had succeeded where the infantry had stalled.

Going back into Draguignan, I met my first German general, after close association with the German army since December of 1942. He was seated on a park bench having a nice quiet dignified weep. With the general was his orderly, general's suitcase in hand. They were in the custody of a cavalry corporal from Troop C and surrounding the pair was a circle of dismounted tankers whose column had moved into but not yet through the town. These tankers were holding back the excited mob of French villagers. The old general was a fatherly appearing soul and I have often wondered the cause of his tears—whether it was chagrin and disappointment, or living fear of the howling mob.

As kindly as was the general's appearance, I take it that he was something of a Hun in his dealings with the populace—and how they were calling for his blood! I had with me a French lieutenant as interpreter. This officer, in addition to speaking English, spoke some German; he was Jewish. The LXII Corps commander rose on my approach and rendered me a military salute, holding his salute until I returned it. The German army had ceased the "Heil Hitler" business. Receiving the surrender and making some statement as to the fight the general's troops had made, I informed the prisoner that I was sending him under officer escort to my corps commander, and thereupon our new acquisition embarked upon his first jeep ride under the chaperonage of a Frenchman—furthermore, and of Jewish background.

Ridding myself of our prize package, I hastened up to the advance guard and now the whole column was rolling—but the head was beginning to falter. Things were beginning to click, however. Hodge was able to give me the picture. The artillery battalion's cub plane had gotten up and was giving the point aerial reconnaissance. The cub had spotted a demolished bridge, had reconnoitered a by-pass through some hills to the north and the only delay experienced was that caused by the narrow winding road. The radio nets that had been set up in our planning back in Naples and on shipboard were working.

By making our detour we by-passed a village into which a small German delaying force had just moved. The French reported this but our column could protect itself from such on the march and I trusted to the Maquis to handle the situation, which they did. These stalwart sons of France, and sons of the Blue Devils, the Chasseurs Alpins of World War I fame, proved invaluable to us. They reinforced the meager infantry in critical situations and guarded our life line to the rear. These splendid patriots had carried on literally barehanded since 1940 and only recently had been armed and organized by the United States and England by means of personnel and matériel parachuted in to them. This business of building up the Maquis had developed quite an organization. As indicated earlier, prior to our departure for France I had secured from the Seventh Army officers of this Maquis contact organization to accompany my column and assist in directing Maquis assistance to my effort. As a commentary on this underground organization, it must be recounted that word of the Group had gone on ahead and our advance was eagerly awaited, but so well controlled was the information that the Germans always were in complete ignorance of our moves. It is only fair to state that without the Maquis our mission would have been far more difficult, if indeed not possible. And contrariwise, the presence of our armor and guns added immeasureably to the strength and assurance of the Maquis.

I noticed here the same French reaction to armor that had impressed me in the early days in Tunisia. At one period during that campaign I commanded an international force in the defense of Gafsa. The French under my command were terribly afflicted with "Tankitis." The German armor in France in 1940 had impressed the French Army, the French nation, the French Empire. With this phobia (more than fear) went the conviction that French arms possessed not a single weapon to combat a tank. And at this stage anything that chugged on wheels was a "tank" to a Frenchman.

Contrariwise their morale went sky high when anything "anti-char" was produced. In Africa, I issued my French batteries high velocity 75mm ammunition with which they felt perfectly confident. Even our little 37 millimeter, so-called and obsolete before manufactured, anti-tank guns gave them confidence. A French soldier with confidence is the equal of any soldier in the world. And so with the Maquis. Our heavy tanks, our artillery and our self-propelled anti-tank guns sent the guerrillas into ecstacy. And how the Germans dreaded the fierce Maquis!

The German dread of the Maquis came to the surface continuously during our race into the interior. Really, some of our adventurous young officers became quite persuasive salesmen. Many and many a garrison was taken after a few shots—an American advanced under a white flag, and a parley. If the German commander could be convinced that he and his force would become American prisoners and not be turned over to the French, surrender usually was accomplished forthwith. Occasionally it took a little additional shooting on our part. In no instance did the Germans ever violate our white flag or the "negotiator."

Later when skirmishes and rapid advances piled the two armies together in the Battle of Montelimar, this sensibly pleasant process of war naturally gave way to killing and torture. And with this turn in the battle died a fearless officer and forceful conversationalist, Captain Omer F. Brown, the commander of the assault gun troop of the Reconnaissance Squadron. He was killed along the banks of the Drone near Grane when his guns made a valiant stand against a determined tank attack by an element of the 11th German Panzer Division.

The work that the little cub planes did for us was as remarkable as any this little brave part of U.S. Army did amongst all its unbelievable exploits. How or why the cub plane survived will ever be a mystery to me. Of course their principal mission was artillery observation and as an infantryman I soon learned that they brought us double comfort. They directed fire—but best of all, they kept down enemy fire merely by being in the air. German gun and mortar crews lay "doggo" when the little fellows were on the prowl. The smart gun crew knew that a battery seen was a battery destroyed when a "Maytag Bomber" was aloft.

In planning my Force, I included a liaison plane from the Corps pool of L-5s. I felt such a craft would help me. I had used the equivalent of one early in

Africa when things were on an extended scale and I knew there was use for one on this mission—if we got into the open spaces. The more eyes the better and surely it would serve in a crisis if radio with Corps failed—which it did. I had asked for a certain type of radio equipment, a "299," in setting up my organization but Corps felt that the "big picture" would not permit my having what I asked for. Accordingly I left my own radio, which was part of the Corps command net, back at our starting point as a relay station and sent my messages all during the first and second days from my forward position by scout car radio to my aide who was with my Corps radio vehicle and he in turn, moving forward, kept in touch with me and attempted to relay to Corps. Naturally the system did not work. At the end of the second day I received a handwritten note from Truscott. It was written the evening before and he burned me up for not keeping him informed. It was a hot note and I was glad there was no telephone communication between us. Amongst other things, he directed me to report by radio every two hours—but he also sent me the equipment I needed.

While the artillery cub worked like fury the first day, the one pilot being in the air over 10 hours, the Corps plane let me down. The artillery pilot did not do a single piece of artillery spotting but he literally towed us along behind him. He would buzz a road and give his report to the advance element commander who then could sweep on if an "all clear" was the report or act with swiftness where trouble existed. My Corps lad however reacted to his mission in a different way. He had not reported to me in person but worked under the personal supervision of the Corps Chief of Staff and was to "liaison" with me.

Like many young officers who find themselves around higher headquarters, this pilot had ideas of his own as to his object in life. He never did come into my radio net that first day nor did I ever see him or have a report that he was over the main body. However, he was over the area, this much we know, for late the second day, several hours after we had reached Sisteron, I received my first radio from Corps—the very first radio I had had from Corps since we took to the road. Presumably it was from the Chief of Staff. It reported that as of such and such a time at such and such a location, Corps Liaison plane such and such had reported elements of the Reconnaissance Squadron proceeding in an overly cautious manner. I was to take corrective action! The elements in question and at the time given had been off as flank guards and had done a good job! Anyhow that was yesterday morning and this was this evening and we were 75 miles forward of where the "offending" troops had been sighted. I took appropriate action and heeled the message into the dust.

The young aviator was more interested in running home and telling "teacher" what he saw than in telling the troops what he saw. His radio was on our net if he wanted to communicate with me and in any event he could have dropped a message.

Our enlisted artillery pilot was different. He appreciated ground action. He hunted, he saw, and he communicated, and that is how he towed us along with his "kite." I cannot help but mention this incident because it is so typical of what one invariably may expect from the youth and inexperience who out of a clear sky become headquarters johnnies—and this includes some aides.

To return to the chronology of the day: For the main column, the sun shone, the birds sang, the flowers bloomed, the French went mad, and the vehicles rolled on. Occasionally there was a stray enemy staff car or motorcyclist to be dispatched, but otherwise the advance was a parade until the point approached Quinson. Our energetic artilleryman in his chug-chug cub had reported a formidable bridge destroyed just south of the town—and our engineers still miles away. The lead vehicles got across a ford but jeeps stuck. The town of Quinson was pressed into service and men, women and children turned out to maintain a ford for us. Not only did they maintain it, they even improved it and all vehicles crossed as the enthusiastic French pushed and heaved and with knowing eye carried select flagstones to dump flatwise into the swirling current. In no time at all they had transformed the bouldery bottom. Maintaining a ford for heavy tanks is no mean problem, but those French were willing—and so happy.

From these good souls we learned how the fine modern reinforced concrete bridge had been destroyed. In the pre-invasion air preparation that was to "isolate" the landing area, our bombers had gone after the bridge time and again but never registered a hit. So alas, a bridge so important that it must thus be bombed at time and time again must be destroyed. If the American air is so unfortunate as to miss this bridge—eh, enfin—the Maquis will do it. Has not explosive been dropped for this purpose? Voila, the bridge, he is no more—and do not bother any more. As a matter of fact, our progress was most seriously impeded by damaged or demolished bridges that the Air had missed but which the Maquis had not.

After Quinson, we rolled on and on. At each halt the road was cleared and all vehicles got under cover in the woods and brush. No air, friendly or enemy, had come over but we just naturally took to the shade. And later it was well that we did.

With still four hours of daylight before us the point reached Riez—the town I optimistically had picked out for my first day's destination. We were there and ahead of time. Should we go on, or should we hole up for the night and sacrifice those remaining hours? I decided to hole up. The vehicles had about five hours gas left in their tanks—and armor without gas is a poor fighting tool. I could not cut down less than that and still fight the vehicles if need arose. We had strapped on to the vehicles anything that would hold gas that we could lay hands on but even so the heavy grades, the de-

tours and the long miles run, had eaten into the gas. Our supply trucks had delivered us our refill late the night before and then returned to the beach for a new load. The precious gas refill could not rejoin until after dark. The column therefore was closed up, the bivouacs set up for instant defense and the whole area outposted —the cavalry out at a distance on the roads and the infantry close in. The tankers took their turn too.

As the main body advanced on Riez this first day Troop C off to the east, after its first haul of a Corps headquarters, kept working to the north opening roads and taking prisoners. Despite my friend's observation in the Corps liaison plane, they were very active on their main axis. So also were the sections and platoons that scurried over roads and trails between the main body and Troop C, working and probing always to the north so that no undetected enemy movement could come from that flank to interrupt the speedy advance of the Force it protected.

In like manner the cavalry scurried to the west and northwest prying, peeking, reporting. One platoon of Troop A, reinforced with a section of tank destroyers was given the specific mission of reaching Barjols to the west and blocking that important road center. The town was entered as so many towns were entered by armor, only to find itself in a drove of pestering, buzzing sniping enemy infantry. And in this particular town the enemy wheeled out his own self-propelled guns. Under such circumstances, armored cavalry, if discreet, withdraws, even if covered by one's own, very own, tank destroyers. The mission of the platoon was first, information; secondly to block egress from the town until relieved by Infantry. The little force accomplished its mission and knocked out two German self-propelled guns to boot. I had promised my little flank patrol that the infantry would be out to relieve them by dark, and a motorized combat team of the 45th Division made the vicinity of Barjols that night over the way our force had cleared. The infantry arrived none too soon for our small force was in serious trouble. It was running out of ammunition and with the coming of darkness German riflemen were working out of town in force. Barjols was building up. The 45th made a brilliant fight there and for two days a full scale scrap raged before the Germans would fold up even though cut off and surrounded.

By the time reports by radio came in from Barjols that first evening, from constant reports from the east and from information picked up from the Maquis, I had the first semblance of an outline of the probable situation confronting me. Accordingly I called in Troop C from the east instructing them to leave an outpost above Ampus, some 10 miles north of Draguignan until the 36th Division moved up and to turn the prisoners over to the infantry. Our force being as small as it was I anticipated that I could not spare a man for prisoner-of-war care. The pre-jump-off solution for this anticipated situation was simple. All units were instructed to interrogate prisoners by sampling and then turn them over to the French. But when my young crusaders developed their hidden forensic powers of persuasion and the Germans with vigor set down a condition of surrender that stipulated that the Reichswehr was to board with the U.S.A., my plans were upset. However, we had to sweep on. My usual solution involved a technicality. I would direct that an American noncommissioned officer would command the prison guard of French. We just could not stop nor could we set up PW enclosures all along our extending route. There were more buzzards on ahead!

The decision to stop at Riez was a happy one. No sooner were we off the roads than a flight of German bombers with fighter escort was over us. No sign of us did they see and they continued on to the beaches for a bombing that was costly to the elements still in process of landing. By now too the Germans were panicky. Before we got to the Riez telephone exchange the mayor had a call from the German headquarters at Digne—just 12 miles away. The German general had heard rumors of Americans coming north from Draguignan. "Was it true?" Communications were out everywhere. Those Maquis! Since Riez had maintained its lines there would be no reprisals there, but "take heed!" Apparently the mayor's report satisfied our neighbor for not a single German patrol came near an outpost that night. But "those Maquis." Germans never did like a dark night when Maquis were on the prowl. They stayed locked up in their barracks.

The arrangements that had been set up for Maquis contact were working. Soon there were leaders reporting for instructions. Identities were authenticated. The most welcome and most valuable visitor that first evening at Riez was an American captain—a paratrooper. He was one of several teams who were dropped in prior to the invasion. With him he had a tough little Frenchman, a sergeant. The Frenchman was in the uniform of a Blue Devil, beret and all. And was he a tough bunny—about five feet tall and five feet broad. He was a World War I veteran, but a regiment of his like would wrestle tanks!

About this time an excited civilian dashed into my headquarters circle. "German tanks were at Quinson." We had patrols about there in all directions and none had reported enemy contact. My aide had just come through, complete with radio jeep and my lumbering Fifth Army type caravan. The French can be like that. When they want protection, they see shadows. However, those stalwart citizens of Quinson had worked hard at the ford and no engineers had appeared even yet. In order that the good people would rest that night in peace and be fit for another grueling day at the ford, I sent an outpost back to the town.

Plans were set for the next day. The main body moves on Sisteron. Troop B, reinforced with light tanks and assault guns (105 howitzers mounted in MIV tanks) and with organized Maquis under my American Captain's command as the infantry component, was given the mission of capturing Digne

where some "several" hundred Germans were quartered.

The Maquis under my hardy paratroop captain also were given the job of establishing and defending a road block on the Route Napoleon at an impregnable position southeast of Digne. It would be embarrassing if Germans from the south poked into our little Battle of Digne of the morrow.

Radio contact with Corps was out and we were unable to pick up any German traffic. It was a little spooky that dark night and even "Sally and George" who had become our radio friends at Anzio would have been reassuring. Oh for Lilli Marlene!

In order that the Corps would have full information on the events of the day and be cognizant of plans for the morrow I dispatched an officer courier to report in person to General Truscott at the same time hoping that on his return to me, my courier would bring me the Corps situation and future plans. Also, could he please find our engineers! So off went my courier in the dark, without light—and without the foggiest notion as to where Corps could be found. My lad found Corps, the staff protected the General's rest, my report was rendered and my courier returned without information—and without engineers. Best news of the night was the arrival of our supply column and the precious gas.

I had gambled on the first refill the supply column carried. Extra rations were carried on the combat vehicles and we started out with an overload of ammunition. Therefore that first day nothing but gasoline was carried in the supply column and well it was. We had plenty of food, ammunition expenditures had been light and we still had basic loads. Next day it might be different. Organic supply vehicles dumped their loads and went back to the beach dumps for more ammunition to be shuttled up against an emergency. No rest for the drivers.

The patrols were active during the night and the outposts alert. There was little business. Anyone approaching an outpost from the enemy side was carried immediately to headquarters. In every case where parties were thus picked up they proved to be Maquis bringing valuable information. No person was allowed to pass outward through our outposts unless passed by Force headquarters and there were no persons picked up under this control.

In all it was a quiet night and by now the prospects of the venture were in everyone's blood. Foot patrols had worked forward towards Digne and with first light the reinforced Troop was off on its mission to hit early and hit hard. The Maquis were at the appointed assembly areas.

At daybreak the advance guard of the main body advanced through the outpost on the Riez-Oraison road and all was set. Patrols were sent out to the southwest. The main body, consisting of the infantry, tanks, artillery and tank destroyers, was prepared for instant start and held in their bivouacs. I was in my own country now and it was unnecessary to clear roads for any following elements. The enemy, weather and terrain were all with which I had to concern myself. The weather was fine—warm but not hot. The country was beautiful though not too well suited for armored action cross country. The enemy had been bowled over by surprise and was proving not too tough. This was war de luxe and we had not yet had a casualty.

(To be continued)

BOOKS FOR THE HORSEMAN

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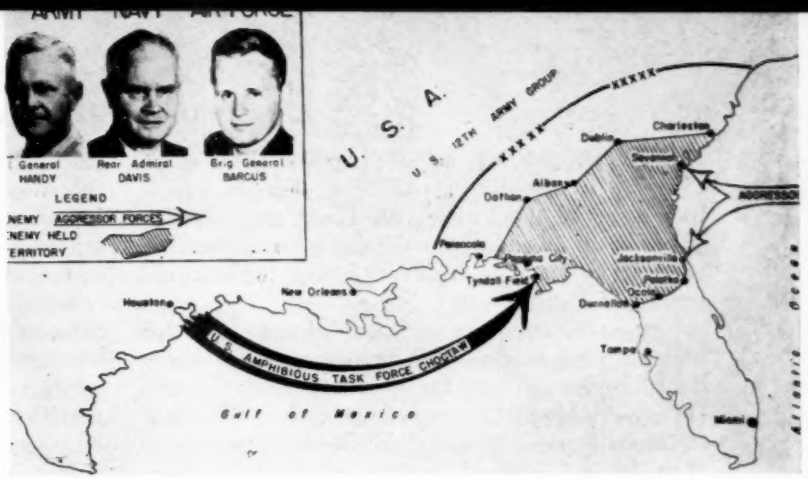
Exercise Seminole



Armor Gets Its First Peacetime Amphibious Training

— Unified Command Succeeds in Exercise —

*by Major William H. Witt**

WHEN the last vehicle of Combat Command A of the Second Armored Division had rolled through the surf and beached at Tyndall Field, Florida, on November 4, 1947, "Exercise Seminole" was immediately termed a training success by planners and observers of the Army, Navy, and Air Force.

Initially planned and conceived as the first peacetime training test of cooperation and coordination between the three services, since unification became a reality, the real value of "Exercise Seminole" lay in the fact that it provided the means of keeping alive the "know how" of amphibious operations, so successfully developed during World War II, and to give to personnel new to the services an opportunity to witness and participate in the practical application of procedures developed during the war or improved since the end of the war.

Of inestimable value to the personnel of the Second Armored was the actual experience gained in the techniques of waterproofing vehicles and weapons for overwater transportation and the loading and unloading of vehicles, matériel, and equipment on and off naval cargo vessels. Loading and unloading procedures were of equal value to the Navy's specialists in amphibious operations.

Exercise Seminole had its beginning in May of 1947 when an AGF directive was issued calling for amphibious training of the Second Armored Division. This was followed by coordinating directives issued by the Navy and Air Force which culminated in the first planning conference held at Fort Sam Houston early in July when representatives of all services—Army, Navy, and Air—met to implement the plan for the exercise.

For the purposes of the exercise a mythical theater of operations, embracing the southern and southeastern areas of the United States, was established and was named the Gulf Theater of Operations. General Thomas T. Handy, commanding general of the Fourth Army Area, was designated as the commanding general of the Gulf Theater of Operations. The commander of the Amphibious Force, Atlantic Fleet, U. S. Navy, Rear Admiral R. O. Davis was designated as commander of the Joint Expeditionary Force and Major General James G. Christiansen, commander of the Second

*Chief, Public Information Division, Information Section, Headquarters Army Ground Forces.

Armored Division, was named as commander of Expeditionary Troops. Brigadier General Glenn O. Barcus, commander of the Twelfth Air Force, was named to effect the air mission after control of air operations had passed from Naval to Air Force control following the landing of troops.

The Joint Task Force to accomplish Exercise Seminole was designated as Task Force Choctaw. Its principal components were the simulated 186th Infantry Division, designated to secure the beach for the landing of the armored elements, and Combat Command A of the Second Armored Division commanded by Brigadier General John H. Collier. In all, some 3800 Ground troops participated in the exercise as well as thousands of Naval personnel manning the vessels which convoyed the Ground elements to the Florida exercise site. Attached troops which augmented Combat Command A were drawn from Forts Sill, Benning, Sam Houston, Bragg, Jackson, and George G. Meade, Maryland. The assumed tactical problem on which the exercise was based presented the following situation:

On July 1, 1947 the Aggressor Navy launched a powerful surprise attack against the U. S. Atlantic Fleet resulting in a partial destruction of our Naval forces in the Atlantic. Elements of the fleet withdrew to the North Atlantic and into the Gulf.

About the same time Aggressor Air Forces using heavy bombers based in the Caribbean area launched heavy attacks against our air bases in the eastern U. S. By July 15 Aggressor Air had achieved air superiority along the Atlantic coast south of Charleston, S. C.

On August 1, Aggressor Ground Forces (composed of the Third Aggressor Army) made amphibious and airborne landings at Savannah, Ga., and Jacksonville, Fla., which were followed by successful drives inland. Subsequent to 1 September the arrival of air reinforcements for the U. S. forces made it possible to stem Aggressor's inland drive.

By August 15 the arrival of the U. S. Pacific Fleet and its engagements with the enemy fleet had reduced the enemy's Naval strength and had denied him access to the Gulf.

At the outbreak of hostilities the commanding general of the Gulf Theater of Operations was given the mission of expelling the enemy forces from his theater of operations. To accomplish this he organized the Third and Fourth armies as the 12th Army Group. The Group initially was forced to withdraw in the face of superior enemy strength, but it was reinforced by the U. S. Fifth Army and this force, coupled with the addition of Organized Reserve and National Guard units, made it possible to stop Aggressor's inland drive by October 1.

Confronted with this lull in Aggressor successes the commanding General of the Gulf Theater of Operations devised a plan to expel the enemy from the U. S. which included the launching of an offensive along the front of the 12th Army Group, assisted by an amphibious landing in the vicinity of Panama City, Florida. The main effort, utilizing the 12th Army Group was labeled Operation Apache and the diversionary effort of the Joint Expeditionary Force, designed to draw Aggressor Reserves from the front of the 12th Army Group, was called Seminole.

Training to meet this mythical situation started for elements of the Second Armored Division early in the summer, such training being complicated by reason of the fact that replacements constantly were being received who were not qualified in basic military subjects. This condition made it necessary to conduct certain basic training concurrently with amphibious training. The problem further was solved in part by devoting the entire month prior to the beginning of intensive amphibious training to a stepped up program of field training concentrated on march techniques, command post exercises and special field exercises.

The importance of coordinated training and the standardization of procedures for amphibious operations between the services was excellently demonstrated in the participation by the Troop Training Unit, Amphibious Base (USMC), Little Creek, Virginia, in the training of the Second Armored Division for the exercise.

A training team of the TTU was sent to Camp Hood, Texas, home of the Second Armored, late in August to carry out its mission of assisting in the indoctrination and training of Combat Command A and its attached units. In addition, officers and enlisted personnel of the division were sent to the Amphibious Base at Little Creek to attend courses of instruction in amphibious specialties and return to Hood to pass on this information to other members of the command.

Members of the team from the TTU presented a series of orientation lectures, training films, and plays. This instruction was followed by specialists courses which included amphibious intelligence, Naval gunfire, communications, transport quartermaster functions, logistics, medical, waterproofing, basic amphibious methods, and shore party functions and procedures.

A dry landing exercise which included complete full-scale beach installations and actual movement of ships loads across it to assembly areas was conducted as the final training phase. This served to prove the effectiveness of staff planning and familiarize elements of the command with actual techniques of landing, including actual practice in the use of debarkation nets rigged on APA mock-ups.

The movement of Combat Command A to the San Jacinto Ordnance Depot, Houston, Texas, begun October 20, was made in two serials, full track and M-25 tank recovery vehicles moving by rail and all other vehicles moving by overland convoy. The overland convoy was moved on schedule due to careful preliminary surveys of bridges, road nets and routes and close coordination with Texas Highway Police. Individual march units were closed on arrival at the City limits of Houston and were escorted through the city by Houston police, without halting.

The parking and waterproofing area in San Jacinto

Ordnance Depot consisted of a single, one-way unpaved road. Due to the short length of the road, it was necessary to park vehicles in column bumper to bumper. Due to this restriction the column departed Camp Hood with vehicles arranged by ship load so that they would arrive in the parking area in the same order in which they were to be loaded. Thus careful advance planning avoided delays which might have been produced if vehicles had to be rearranged for loading on arrival.

Based on preliminary estimates regarding the date when waterproofing of vehicles could be completed, loading of vehicles on ships originally was scheduled to begin on October 27.

Actually, waterproofing was completed and the first elements were loaded on October 25. The remaining loading was done on schedule without incident, being completed on October 29. This was considered to be in record time due to the limitations of the area at San Jacinto. A single narrow entrance was available to LSM, LCT, and LST loading points and only one LST could be loaded at a time. The area for maneuvering in front of the ship's ramp was so limited that the tank transport vehicles barely had room to make the required turns for approach.

The convoy, which included about 50 Naval ships and craft, moved in two groups. The first group, which included the flagship of Rear Admiral Davis, the USS *Taconic,* and ships carrying the Infantry Force (simulated), weighed anchor and moved into the Houston ship channel toward Galveston on the morning of 29 October. The second group, commanded by Rear Admiral E. H. Von Heimburg, and including the armored elements, sailed the following day.

During the voyage across the Gulf to the Florida objective area near Panama City realism was added to the exercise by simulated attacks by enemy aircraft, simulated antiaircraft fire from ships and the employment of rigid black-out restrictions. Progress of the convoys and employment of friendly aircraft was carefully controlled during the voyage by elaborate communications systems on both the *Taconic* and the USS *Mount Olympus,* Admiral Von Heimburg's flagship.

The first group of the convoy arrived at the objective area on D-Day, November 2, and the simulated infantry division, shore parties, and miscellaneous units were put ashore.

It was originally contemplated that a dry landing would be made by the armored elements, so during the night of November 1-2, Naval Seabee parties unloaded and secured steel causeways, which had been lashed to and transported across the Gulf on the sides of an LCT.

Early on the morning of D plus One, preparations were made for the landing of Combat Command A, but due to changes in tides and shore currents it was found impossible to marry the landing craft to the pontoon causeways. Hence the decision was reached to land Combat Command A through the surf to the beaches. This lent realism to the exercise since it was emphasized by all members of the high command present that plans for exercises of this kind must be sufficiently flexible to meet changing conditions, either climatic, hydrological, meteorological, or as the tactical situation dictates.

Another evidence of the flexibility of the Seminole plan occurred in the landing sequence. Initially it was planned to land elements of Combat Command A in the order: armor, artillery, infantry, with supporting troops being landed concurrently as the situation permitted. But a request from the commander of Expeditionary troops directed that the artillery be landed first which was done. By landing earlier than scheduled the artillery was able to reinforce the fires of the 186th Infantry Division artillery (simulated).

Elements of the armored force landed on the beaches under simulated battle conditions with loudspeaker equipment blaring out actual recordings of battle noises and demolitions set off on the beaches to simulate artillery fire. Planes, both enemy and friendly, flew overhead, planes designated as enemy swooping down to the beaches in simulated bombing and strafing attacks.

Opposing the simulated infantry division and Combat Command A was Aggressor, actually composed of some 150 troops, dressed in the distinctive uniforms developed at Fort Riley, Kansas, and using simulated tanks and weapons employing pneumatic rubber construction.

Landings proceeded on schedule until completed on D-plus Two. Units moved inland to designated assembly areas. The armored landing force commander was directed to initiate plans for the breakout from the beach area. Plans included complete employment of all supporting forces, including air and naval gunfire, for the seizure of Panama City, securing the area for future operations. Upon completion of plans and issuance of orders to lower units the operation was terminated. Security of assembly areas was maintained by a perimeter defense and interior patrols, which enabled the units to develop the intelligence phase of the operation through prisoners taken from Aggressor and other intelligence collected.

Reloading was begun on November 6 for the return to San Jacinto, and the elements of the Second Armored returned to Camp Hood late in November.

At the final critique Major General Christiansen restated the objectives to be reached by Ground Forces:

a. Preparation of units and individuals for their respective and collective functions in the conduct of landing operations.

b. To maintain the art of staff planning on a high level for amphibious operations.

c. The development of techniques in loading and landing armored forces and other heavy equipment.

He concluded with the opinion expressed by members of the high command of all three services—that the objectives had been reached in a highly creditable performance. Admittedly, mistakes were made, but it was clearly understood that the exercise was designated for coordinated training and that operational mistakes could be discovered only through practical application.

A NEUTRAL VI

by Captain H. F

Here is an article by ar c Armored Cavalry Jo on a mary interest to the Thi through the eyes of a er o in the late war dema ful members of a natio e re striving unceasingly utio problem as a key to ove the pea e w

GERMANY has been demilitarized. Crossing the German frontier by rail from Venlo, Holland, the train halts at the frontier station of Kaldenkirchen in the British Zone. On the platform are four uniformed German Frontier Guards carrying Lee Enfield rifles. As the passengers alight for customs and passport inspection they are escorted by German officials with side arms. At the entrance and exit of the customs shed are further armed guards. The only Allied representative in the station is an unarmed Englishman whose task is to make decisions when appealed to by the young German passport and customs officers.

Germany today is a land of anomaly; this is merely one example. "There is only one true generalization that can be made about Germany," a correspondent from a London newspaper told me the day I arrived, "and that is that no generalizations can be made about Germany." He spoke the truth.

German economic recovery tomorrow is closely linked with the German economic plight today. The man-in-the-street in Germany does not as a rule concern himself with ideologies. He cannot afford to be an altruist or a philosopher. His first thought is for his daily bread—an uncertain commodity in these times. Next he gives his attention to the future—his future. The community must be disregarded for the moment; his own family and their prospects during the next five years or so fully occupying his attention.

We do not appreciate in Ireland how difficult life is in Germany. Not alone are all foodstuffs, clothing, etc., very tightly rationed, but it is quite frequent for coupons not to be honored for several weeks at a time, due to scarcity of supplies or transport. A four-month drought this summer has seriously injured the German potato crop. All areas suffer occasionally from non-distribution of rations, but probably the worst hit of all is the Rhineland, with its crowded cities of Köln (Cologne), Düsseldorf, Bonn, etc. The British Zone, with over twenty-two million persons, is the most populous zone. It is also the most highly industrialized and least agricultural. This alone is a cause of shortage. In addition, since the recovery of German economy depends upon industrial exports and especially upon Ruhr coal production, heavy workers and coal miners must receive additional food rations. Non-industrial areas in the British Zone, such as the Rhineland cities, suffer accordingly, as rations for the industrial workers must be honored even if others go without. However, it is interesting to note that, if always delivered, the British Zone food-scale, calculated in calories, is almost as high as the American, whereas the French and Russian food-scales are far less than the British.

Foodstuffs are not the only rationed goods. Clothes are virtually nonexistent. The monthly soap ration is a piece of *ersatz* soap rather smaller than a box of matches in size. By the same token, matches are rationed to one box a month. Shoelaces cannot be bought —string dipped in ink replaces them for most people. But many, especially in the Rhineland, have no shoes. Goods which are not rationed in most cases simply cannot be bought on the open market.

The German *Reichsmark* is a coin without a known value. There is no official exchange rate, but Occupational Personnel can purchase marks at 6d. (10 cents) each. To the German buying his rations the mark is worth something nearer 1s (20 cents). But apart from rations and the very few minor items which can be bought in the open market, the mark is almost valueless. Cigarettes are the universal currency, at the price of five marks per cigarette. There is a mistaken impression, possibly fostered by certain journalists' stories, that the cigarette passes from hand to hand as currency until at last the blackmarketeer or farmer smokes it. The truth is that practically everyone smokes a cigarette immediately on getting it. Coffee, another unobtainable commodity, is more precious even than cigarettes, but being bulky is a less handy form of currency. The universal payment for services is a

★AN COSANTOIR, Irish Defense Journal.
★★Ex-Cavalry Corps, Irish Army.

MITS GERMANY*

*H. Fitz Gerald***

by ar contributor to the Jo on a subject of pri- he This treatment seen of a er of a neutral nation ma full consideration as tio e representatives are gly ution to the German to overy of Europe and ea e world.

cigarette, an unfortunate exchange medium.

The black market is now thoroughly organized and is immense in its ramifications. The authorities can do little to control it, for the shortages are too great. In Berlin most of the supplies for the black market come from the Russian Zone, through the Russian Sector of Berlin, but are sold in the French Sector.

Results of Bombing

The economic collapse of Germany in 1945 was not due merely, or even mainly, to bombing. Undoubtedly the bomb damage is immense—and it appears to be greater because after two years no effort has yet been made to demolish the shells of buildings which tower precariously towards the sky, roofless and tottering and unreal. Only in Frankfurt a. M. have I seen any start at clearing the rubble. Elsewhere streets and pavements have been swept to allow traffic to pass, but the bricks, girders, remains of furniture, baths and bedsteads, are piled up on either side of the thoroughfare. Köln is the perhaps worst damaged city, for suburbs which the bombs left intact the battle swept away.

But all large cities appear desolate. Berlin's Wilhelmstrasse and Den Linden are for all the world like an untidy version of the Roman *Forum* on an immense scale. The Reich's Chancellory, where Hitler and Eva Braun spent their last days, and in the garden of which they were cremated, holds in its *foyer* the rusted remnants of tanks and trucks; even a twisted Lewis Gun lies near the entrance still undisturbed two years after the last shot was fired by Zhukov's Red Army troops.

However, the actual injury to production caused by strategic bombing was extraordinarily slight. In Germany industry was not concentrated in large cities but dispersed. As a result, for instance, Hamburg, a large port and industrial center which received some of the heaviest Allied air assaults, was responsible for only 3.36 per cent of the total German war production. The 8,600 tons of bombs reduced this figure to 2.35 per cent—a loss of 1.01 per cent of the German war production; a mere trifle.

The greatest attacks upon a single industrial target were the raids upon the Schweinfurt anti-friction bearing concerns. Four hundred and fifty tons of bombs were dropped on a concentrated area; the result, destruction or damage to 10 per cent of machinery and loss of 20 per cent of stocks of completed bearings. Again, not a startling result.

The *U.S. Strategic Bombing Survey* (Washington, 1945) computes that it required an average of 15,000 tons of bombs to reduce German industrial production by 1 per cent. In 1944 the production loss was 17 per cent per annum. In the first four months of 1945, when raids were intensified and the French airfields employed as Allied forward bases, this figure increased to 19.5 per cent per annum. But many industries, destroyed in one place, reopened elsewhere within a very short time.

Damage to dwelling space was far more severe than damage to factory buildings. Fire raids, which were comparatively useless against factories, were responsible for 75 per cent to 80 per cent of the dwelling-space destruction. Hamburg lost 31 per cent of its dwelling houses in the raids mentioned above (that is, 300,000 houses), Bremen lost 7 per cent (5,680 tons of bombs dropped). Only 49 cities of a population exceeding 200,000 were deliberately raided. In all, 25,000,000 German civilians were subjected to air attack, of whom 305,000 were killed, 780,000 wounded and 5,000,000 evacuated as a result of bomb damage. To complete the record, it is of interest to note that the RAF and USAAF lost in action 158,546 all ranks, or one *trained* Allied life for less than two German civilian lives! Strategic bombing was not attempted by the Red Air Force.

At the worst period, 20 per cent of Germany's non-agricultural workers were engaged in bomb-clearance, removing plant to new sites, etc. This was a serious strain on man-power, but it should be noted it is taken

into account in the figures for the total loss to German industry given above.

The most successful raids were those on transport, especially upon the railway-systems of Germany. The results are still visible today—nearly every siding shows evidence of burned-out rolling-stock, and it is not infrequent to see burned and rusted trucks and even locomotives lying disregarded at the bottom of railway embankments. From August 19 to October 28, 1944, the total railway truck-loadings were reduced from 899,091 to 703,580, a loss of about 22 per cent. This achievement, however, required 35,000 tons of bombs. And in spite of the offensive by Allied air power, the net rail ton-mileage at the end of 1944 was higher than before the outbreak of war in 1939!

Strategic Bombing Uneconomic

If the above figures show that bombing could not cripple industry, there are other figures to show that it could not break morale. According to Nazi estimates which have the appearance of being fairly accurate, the morale in twice-bombed cities was higher than in unbombed communities. Over 1,400,000 tons of bombs fell on Germany, yet industry and morale were not substantially reduced. The *U.S. Strategic Bombing Survey* states that "Even if the final military victories that carried the Allied armies across the Rhine and the Oder had not taken place . . . the German armies would have had to cease fighting within a few months." But it goes on, "In the actual case—as in most cases in the history of wars—the collapse occurred before the time when lack of means had rendered further resistance physically impossible." Surely this, taken with the figures quoted above, is an admission that the victory of the Allies was not due to strategic bombing.

A competent observer, writing in the English journal, *The National Review*, a few months ago, summed up the whole question of strategic bombing as follows:

"In 1918 we had no strategic bombing of Germany, and there was only one front, for Russia was out of the war. The decisive battle was at *Amiens*, August 8, and Germany surrendered three months later. In 1944 we had the strategic bombing of Germany, absorbing the services of some 28,000 combat planes and 1,335,000 men—which does not include the masses of men and women working in aircraft factories, etc. Mighty Russian armies were also sweeping down upon the enemy's rear. The decisive battle was at *St. Lo*—not far from *Amiens*—July 25. Yet the enemy prolonged his resistance for nine months. It is hard to reconcile this with the alleged overwhelming importance of strategic bombing. The enemy was already beaten before the bombing had produced anything like the ruinous effects expected."

If victory is to be gained not in the air but on the ground—as it was in Germany and also in Japan (for the A-bomb did not defeat Japan, but merely gave an excuse for a militarily crippled nation to surrender)—surely there is far better employment for the men and material expended on strategic bombing if used with the ground forces as soldiers, tanks and guns. Or if as airmen, then as an airborne army, such as would have turned the scales at Arnhem, had it been available.

With the annexation by the U.S.S.R. and by Poland of East Prussia, Silesia and all German territory east of the Oder and Neisse, Germany lost her great agricultural area. Germany was never completely self-supporting as regards foodstuffs, but a very large proportion of the agricultural produce came from the regions beyond the Oder, especially from East Prussia. For over a century German economy was organized upon this basis. Accordingly, the loss of most of the German "larder" is undoubtedly the greatest cause of the postwar economic collapse. This is further aggravated by the fact that the Russian Zone of Germany (the portion under Russian occupation but not for-

MAP OF THE FOUR ZONES
OF OCCUPATION OF GERMANY BY LÄNDER

BRITISH ZONE.	U.S. ZONE.
Land Nordhein-Westfalen	Land Hessen
Land Niedersachsen	Land Würtemberg-Baden
Hansestadt-Hamburg	Land Bayern
Land Schleswig-Holstein	Land Bremen (*Bremen Enclave*)
FRENCH ZONE.	**RUSSIAN ZONE.**
Land Rheinland-Pfalz	Land Mecklenburg-Vorpommern
Saarland	Land Mark Brandenburg
Land Süd-Baden	Land Sachsen-Anhalt
Land Süd Würtemberg	Land Thüringen
	Land Sachsen

BERLIN—*Four Sectors.*

mally annexed) is permitted to transfer only a small portion of its agricultural surplus to the Western zones.

As a result the British and U.S. Military Governments have been compelled to redesign the economy of their two zones. Food must be purchased abroad, and to pay for these imports Germany must export. It is for this reason primarily that the *Bipartite Board* (British and U.S. Combined Zones) has authorized a considerable increase in German industrial production, abandoning the original Potsdam agreement. In the case of the steel industry, for instance, the *Level of Industry Plan* of March, 1946 limited annual production to 5,800,000 tons, whereas the new scheme fixes the maximum at 10,700,000 ingot tons. The late British C. in C., Marshal of the RAF Sir Sholto Douglas, announcing the new *Level of Industry Plan* on August 29, 1947, stated:

> "The fact that the 1946 plan has for some time been regarded as obsolete has produced a most unfortunate atmosphere of uncertainty in Germany . . . The importance of reaching a firm and reasonable settlement has increased with the passage of every month."

British and U.S. Taxpayers Foot the Bill

Under this new economy Germany must export more than ever before. But at present it is not even possible to reach prewar figures. In 1936 the monthly production average of steel ingots was 1,155,917 tons; in June, 1947, it was only 204,209 tons. The same is the case with practically any other statistics one might examine.

To make up the enormous deficit of foreign currency for the period while German industry gets under way and begins to export, Britain and the U. S. contribute an annual sum of $300,000,000 each, with which food and other essential imports are purchased for the German population. In the month of August, 1947—the latest month for which figures are available—the British Control Commission bought for the residents in the British Zone 480,000 tons flour, etc., 8,898 tons skimmed milk (from U.S.A.), 217 tons cheese (from Denmark), 150 tons fresh vegetables (from Holland), and 8,614 tons fish (from United Kingdom). In November 1947 the U.S.A. generously undertook the burden of supplying a considerable portion of Britain's dollar contribution, thus relieving somewhat that unfortunate nation.

Some foodstuffs are also sent into the Combined (British and U.S.) Zones from the Russian Zone, in exchange for manufactured articles, etc., but on neither side is delivery up to date.

The French do not contribute financially to German imports, in the manner of Britain and the U.S.A. The German correspondent of an Irish newspaper wrote recently that the French make their zone *"self-supporting."* This is not strictly accurate—while the French Zone is mainly agricultural, at the same time there is a considerable deficit which is paid for indirectly by the British and American taxpayers.

Apart from the problems created by the Soviet and Polish annexation of large parts of eastern Germany there are other reasons for the economic collapse of the Reich. With the dissolution of the native government a condition of anarchy arose. This anarchy—which is really a void in the social order—cannot be overcome by temporary foreign rule. It is important to remember that in Germany there exists a situation which has never before been experienced in modern (post-Roman Empire) Europe: *the government of an immense and powerful nation surrendered unconditionally and suddenly ceased to function, leaving no successor.* In 1918 the victorious Allies dealt with the government of the new German Republic; in 1945 they recognized no government. In spite of all the Allied powers could do anarchy set in, control was lost, human incentive failed, communal ties disappeared, and the German population—imperceptibly but inexorably—went socially and economically "amuck."

It is generally felt by the Germans and Occupation Authorities alike that a single controlling power, instead of four distinct Commissions, might have gone a long way towards saving Germany from the chaos of the present time. The British CCG and American OMGUS recognized this officially some months ago when they merged their two zones for economic matters. They sought to get the French to join them, but without success.

Other reasons for the acute situation in Germany are the black market—but for which the weekly rations might be at least doubled—the world crisis, which compels all nations to give full attention to their own domestic problems, and the acute shortage of manpower due to the retention of prisoners of war by the British, French and Russians.

Zonal Policies

Recognizing that it is essential, not alone for Germany but for Europe, that German economy should stand upon its own feet as soon as possible, the British and U.S. Military Governments do their utmost to insure that the occupation forces shall not constitute a strain upon German resources. For this reason all food eaten by British and U.S. officials is imported from their own countries (the British are rationed on the same scale as in the United Kingdom), the black market is held down by the issue of special occupation currencies (sterling and dollar), CCG and EUCOM have instituted their own public transport systems in the major cities, leaving the local transport systems almost entirely to the Germans.

At present control of local government, economic affairs, etc., is gradually being handed over to Germans. In the meantime the military are largely being replaced by civilians, especially in the British Zone. There one sees few uniforms, even military officers in CCG wearing mufti in their offices. There is a good reason for this; military government is essentially the antithesis

of the liberal-democracy which the Western Powers are trying to instil into German politics. The British CCG therefore tries to appear as unmilitary as possible and has in fact almost withdrawn the uniformed "strong-arm" which acted as a continual reminder to Germans that the victor is in occupation. However, at times democratization is jarred by such events as the recent seizing in Germany of all copies of a British newspaper carrying a critical attack upon the personnel of CCG and the banning of any translating of the article. Similarly the "demilitarization" of German youth was not assisted by the British military tattoo held recently in Berlin against the advice of the civilian elements of CCG. By and large, however, the British have undoubtedly adhered more rigidly to the prescribed policy of the Allied Control Council than the other powers.

The U.S. policy is in principle similar to that of the British, but it is less consistent in its application. Furthermore, in the U.S. Zone one observes far more uniforms than in the British Zone, and all control is carried out upon strictly military lines. A rather interesting difference between the zones, and one which reflects to some extent the mental attitude of the two Powers, is the fact that in the British Zone a great number of Englishmen have learned German and speak it (atrociously but with the best intentions) on all possible occasions, whereas few Americans can or will speak German. Yet there appear to be more *Schmidts* than *Smiths* in the American forces!

The economic policy of both CCG and OMGUS, now combined under the *Bipartite Board*, the *Bizonal Economic Council*, the *Joint Export-Import Agency*, etc., is to make western Germany self-supporting by being able to pay through exports for all vital imports, and also to permit Germany to take her economic place in a Europe which cannot exist without German coal, steel and other commodities. Politically Germany is to be a democratic state, but militarily she must be left impotent. Whether this may in time turn out to be a short-sighted policy remains to be seen, but both France and the U.S.S.R. are insistent upon demilitarization, and in view of earlier pronouncements by the U.S. and Britain, and indeed of present popular feeling at home, there is little likelihood of any immediate alteration in this respect.

After two years of vacillation the Western Powers have decided to dismantle, as reparations, some 800 factories in the Combined Zones. Since the end of the war nearly all these firms had gone into peacetime production and the recent announcement is regarded as a serious blow to German economic recovery. The case of the Kiel *Holmag-Werke* Diesel-engine concern which was permitted to exhibit at the Hanover Fair last summer and subsequently was closed for dismantling, has caused much bitter criticism. The criticism is aided by Communist propagandists who do not hesitate to point out the incongruity of Allied efforts to rehabilitate German industry on the one hand and dismantling orders on the other. In the Soviet Zone dismantling was completed long since, before the Germans had recovered sufficiently to protest.

French Territorial Claims

Policy in the French Zone is more readily understood, for it is straightforward. From 1940 to 1944 German armies occupied France; now comes the "payoff." While making nominal efforts to "re-educate" and "democratize" their Zone, the French are chiefly concerned with ensuring that Germany will never again be able to invade French territory. The French have little sympathy for the population of their zone, and this is not difficult to comprehend.

At the same time the French government has the support of practically all political parties at home in its territorial demands; Saarland has now been virtually incorporated into metropolitan France—without consultation with the other Allied Powers—and demands are heard for *"a frontier on the Rhine"*—that is, the Rhenish Palatinate (*Pfalz*), etc. The Ruhr, Germany's industrial heart, in the British Zone, is also mentioned; in September, 1945, General de Gaulle said in a public statement, *". . . It is therefore indispensable that the eastern frontier should contain—beyond the Rhine —the Ruhr and Westphalian valleys as well as that of the Saar,"* and in the past two years these sentiments have been repeated more than once.

Soviet Security Measures

For the average person in western Europe there is one question of vital interest: what are the Russians like, both individually and in the mass? There is so much disagreement amongst those who ought to be in a position to answer this query that rumor and wild fancy in no small measure replace fact.

The Russian Zone of Germany is not easily penetrated by western journalists, and much that they see forms part of "conducted tours" similar to those organized for visitors to the U.S.S.R. On the other hand the Russian Sector of Berlin can be entered without formality and does in some measure reflect conditions throughout the Zone.

British and American officials in Berlin generally avoid entering the Russian Sector unnecessarily. There is good reason for this, for on not a few occasions Russian patrols have detained uninvited wanderers overnight. I met a young American girl who had recently spent a night in her car watched by two Russian sentries—her German driver had driven unintentionally into the Russian Sector after dark.

Some months ago it was a quite frequent occurrence for Russian patrols in the "corridor" from the western zones to Berlin to fire upon Allied cars travelling on the *autobahn*, but more recently they have desisted, as a result of complaints from the British and Americans.

On the other hand, one may spend a considerable time in the Russian Sector (and probably also the Rus-

sian Zone) without encountering any unpleasantness. It is in the main a matter of chance. Why is this so? There is only one ready explanation. Presumably a *"Standing Order"* from Moscow states that local commanders are responsible for security, leaving it up to the local commanders to decide the exact form of the security measures to be adopted. And commanders know that Moscow will stand over their actions.

Individual Russians vary in appearance, manner, etc., for there are a great number of different races amongst the Soviet troops—White Russians, Tartars, Kalmucks, Slavs and Mongols. If one thinks of Russians as revolutionaries, however, one is apt to be disillusioned. Meeting Russian officers in Berlin I found them unexpectedly "western," reminiscent of something I could not at first trace. Then I realized what it was. They came straight out of Russian novels and plays of the nineteenth century; they were Tolstoi's *Prince Andrei* and *Captain Denisov,* Tchekhov's *Ilya Shamrayev* and *Boris Borisovitch*. The greatest revolution the world has ever known could not kill tradition, and Tsarist courtliness has endured until 1947. The privates and corporals are the peasants of *"War and Peace"* and of *"Karamazov."*

The Russian Zone shows every sign of well-ordered production. Fields are harvested, crops planted. There are few factories left in the Russian Zone (a large number have been transferred to the U.S.S.R. as reparations) but those that remain are in full production. Disregarding the spiritual and human aspects of the matter and considering it as an economic problem only, there is no doubt that the Soviet system results in far greater production than the British. Personal liberties are not allowed to interfere with factory work, trade unions do not slow up the assembly line with dissatisfied murmurings. Perhaps once . . . two years ago . . . —but references to Siberia are considered bad form in these regions, *tovarishch!*

The Soviet method differs in almost every respect to the U.S. and British, and in many cases Soviet policy can claim to be more logical and consistent. In the western zones *denazification* is carried out with scrupulous care and few if any are the cases which pass undetected. Unless an ex-member of the Nazi party can prove that he was active against the party he is automatically found guilty and can be given employment only as a laborer. (An exception is made for doctors, since they are scarce in Germany.) The result of this policy is that many men who through their special knowledge and experience might be used to great advantage in responsible positions are now wasted as farmworkers, postmen, and so on. The Russians do not waste manpower like this. If an ex-member of the Nazi party is of value in the new social order he is used. Technicians are employed as technicians; men with *Gestapo* experience are found to be excellent for the *N.K.V.D.* It should be noted that the French in their zone are also logical with regard to denazification and do not waste manpower unnecessarily.

There is little doubt of the Russian policy in eastern Germany. Like the rings of ripples which spread out from where a stone is dropped in a still pond, the U.S.S.R. spreads its sphere of influence throughout adjacent states. Clearly the methods adopted are successful. The naïve admission of a Russian officer to whom I was speaking in Berlin sums up the Soviet policy. He said, *"In the Russian Zone all the Germans are satisfied."*

This apparent unanimity was achieved by the virtual elimination of the property-owning and middle-classes. Banks and basic industries have been "nationalized" (that is, vested in the Socialist German *Länder* governments) while other concerns are so controlled as to make proprietors little more than state-appointed managers. Land "reform" has broken the large estates into uneconomic units of 10 to forty acres, owned by peasant and ex-tenant farmers. It is foreseen that the new owners will in time be obliged to seek state-help and adopt state-co-operative farming on the Soviet lines—a method of compelling "voluntary" acceptance of the government's wishes.

Rumors concerning the recent actions of General Paulus, the German commander captured at Stalingrad in 1942, run around all zones, but these tales seem on examination to be more fiction than fact.

"And a Thousand Years . . ."

There are in Germany some 16 major political parties, as well as many minor groups who aspire to be recognized as official parties. The chief parties at present are the C.D.U (*Christlich-Demokratische Union*), the S.P.D. (*Socialdemokratische Partei Deutschlands*), the K.P.D. (*Kommunistische Partei Deutschlands*—not functioning in Berlin or the Soviet Zone), the D.P.D. (*Demokratische Partei Deutschlands*—a "center" party), and the S.E.D. (*Socialistische Einheitspartei Deutschlands*—a merger of the K.P.D. and S.P.D. in the Soviet Zone and in Berlin). There is no large Right Wing party, but in the British Zone there is the D.R.P. (*Deutsche Rechtspartei*).

However, the man-in-the-street has little faith in political parties or politics, and the great variety of political groups does not indicate a particularly interested following. Perhaps the attitude of a majority of Germans to politics can be summed up by two quotations. The first is the slogan of a Centrist group in the Bremen Enclave (U.S. Zone)—"Thirteen years of Hitler and a thousand years of denazification!" The second is the remark of a German driver—"You say to a man, 'You were a Nazi; you must lose your job, or go to prison, or be hanged.' But when Hitler came he said, 'If you are not a Nazi you must lose your job, or go to prison, or be hanged.' And perhaps some day someone will say, 'You were a democrat; you must lose your job, or go to prison, or be hanged'."

German Coal Production—1936 and 1947

Net Pithead Basis—Metric Tons. (*Report of Military*

Governor, OMGUS, Statistical Annex, No. 25)

		British	Soviet	French	American
HARD COAL	Monthly Average 1936	9,746,000	293,000	967,000	120,000
	July 1947	6,074,000	243,000	916,000	126,000
BROWN COAL	Monthly Average 1936	4,290,000	8,648,000	—	337,000
	July 1947	4,807,000	8,699,000	—	329,000

The Germans have little confidence in their own people's ability to govern. Even many who are bitterly anti-Ally will remark that they hope the Allies will not leave Germany for many years. This is also no doubt partly inspired by a fear of Soviet infiltration and annexation should the British and Americans leave Germany to her own devices. Even the recent statement to a *Catholic Herald* reporter by Lord Takenham, who is responsible for British administration in Germany, that, *"We have no intention of quitting Germany, in any future under discussion,"* has not measured many people. In western Germany there are surprisingly few Communists, even among those groups whose conditions and environment would tend to turn their sympathies in that direction, for the word "Communist" is regarded as synonymous with "Russian."

The Next Winter

The condition of life of the vast majority of Germans compels them to turn their attention to purely personal and material considerations. The great fear of all is that next winter should be as severe as the last. The standard of health, even in the U.S. Zone, is so low that any additional strain will be disastrous for many people. In the British Zone, where for two years conditions have been far worse than in the other zones, fear of the coming cold spell is intense. One observer estimates that deaths there may rise as high as 10 per cent. This is an exaggerated figure, for 10 per cent would be over 2,200,000 persons! But a hard winter would undoubtedly cause terrible hardship in the British Zone. In Berlin, cut off as it is from all hinterland where fuel and vegetables might be obtained, there are similar fears for the coming winter months.

As in Britain, in Germany the key to recovery lies in the coal mines. It should not be forgotten that German Industry requires not merely to return to prewar export figures but must exceed them, for Germany can no longer feed itself as completely as before the annexation of East Prussia and the territories across the Oder and Neisse. This production—and especially the coal for this production—must come mainly from the Ruhr, in the British Zone.

Coal production in the Soviet, French and U.S. Zones is now practically at 1936 figures, but in the British Zone it is far below this standard. (See chart above.)

Future Prospects

Looking beyond the coming winter to the summer of 1948, there is every indication that economic recovery will by then be in sight in western Germany. Driving through the Ruhr, from Mülheim to Dortmund, every factory chimney can be seen smoking. It is a strange reflection that an anti-German Englishman or American and an anti-Allied German are agreed that the Bipartite policy is, in principle if not in practice, the only hope for German recovery. On the other hand the policies of the U.S.S.R. and of France, however much they may benefit their own countries, cannot be claimed as advantageous to Germany. Both Russia and France, each for its own reasons, have opposed the Bipartite measures, but there can be no doubt that Western Europe as well as Germany requires German industry.

The new *Level of Industry Plan* is still not sufficiently loose and flexible to permit complete rehabilitation. It is estimated that Germany must export 15 per cent more than in 1936—but on account of the limitations placed upon certain industries (which might be convertible to war-production) the actual required increase of permitted exports over the 1936 export figure of the same goods is 90 per cent—a figure which the *Bipartite Board* frankly recognizes as unobtainable. But there is hope in the fact that Britain and the U.S. have broken away from the restrictions imposed by the U.S.S.R. (which at the same time failed to fulfill its own production and delivery commitments with regard to Germany and the Western Allies) and having introduced one new *Level of Industry Plan* may decide later to authorize another.

Economy and Politics

The present tendency is to regard the world problems as purely economic ones. If this were correct, one could with little hesitation, be assured that German, European and world recovery are in sight. But economics is the tool of politics; and it is rather in the political than in the economic arena that the decisive play will take place. There is no longer any doubt that world ideologies are divided into two camps, and there is no middle course. Many British journals and statesmen, apparently forgetting the Munich fiasco of 1938, talk optimistically of the future, and even Americans can show an extraordinary amount of wishful thinking on this subject, but in Germany there is full realization that the conflict will not be resolved around a conference table. Among many of the Germans in the western zones there is an assumption that if war comes the three western Allies will be Germany, America and Britain.

Whatever the ultimate outcome of the present *impasse*, there is reason to recall the remark made over one hundred and thirty years ago at the Congress of Vienna (1815) about an almost identical situation—*"There is a danger that we may exchange the yoke of Napoleon for the yoke of (Tsar) Alexander."*

WAR POTENTIAL

by Brigadier General Patrick W. Timberlake

A member of the Executive Committee of the Munitions Board, General Timberlake gives us the perspective on an important angle of national preparedness—the pattern for fitting our industrial potential into the defense scheme.

THE ARMORED CAVALRY JOURNAL queried: "HOW GOOD (or bad) IS OUR POTENTIAL TO COMBAT AN ENEMY IN THE DEFENSE OF THE NATION?"

Well, that calls for some strong thinking and whisker rubbing.

Contrary to the extremely pessimistic, the Nation possesses a good war potential, most of which is in residue from World War II.

The United States still retains a great reserve of military personnel in its fine body of veterans of World War II. War plants are still in existence and the workers and management which ran them during the war retain their skill and knowledge to produce items for warfare. Nationally, we have the knowledge of how to adjust our economy for an emergency, and, in an emergency, could call back into being the agencies required to coordinate our economy with our war effort. The personnel who staffed such agencies during the late war—with all their experience—can still return to those activities.

However, all that is on the credit side, and, as time goes on, it will become gradually lost to our Nation. Personnel will grow beyond combat age. The type of equipment used in the past will become obsolete as will some of the machinery and plants which manufacture them. Wartime skills will become gradually lost to the individuals who exercised them. And, some of our specialized industries, especially the aircraft industry, have been permitted to decline with such rapidity that their current production is at a dangerous low. Consequently, if nothing is done, the passage of time will mean a decrease of credits and an increase of debits in relationship to the war potential of the United States.

That passage of time meant lost potential was recognized by our Nation's military planners even before the war ended. They knew that if our potential was not fully protected it would diminish rapidly. They knew, too, that such protection meant that measures had to be taken to replace new potential for obsolete and that future potential must be planned in conformity with progress so that we would ultimately replace the declining with greater and more lasting potential.

Fortunately, a number of things occur in our peacetime economy which offset some of the decline in potential.

The current high level of economic activity is making it possible for industrial labor to acquire new and more intensive training in production techniques. Industrial facilities are expanding. These economic factors tend to offset losses in such techniques by past wartime personnel who are no longer associated with industry.

Other factors such as progress in the development of superior products, research which is ever advancing scientific warfare, better production techniques, etc., also negate war potential lost with the passage of time. However, the deterioration of our abilities to sustain a large-scale war cannot be offset completely without great efforts on the part of those in charge of our National Security.

At this writing, many things have been done to preserve or rebuild our war potential. The over-all title for this effort is our National Security Program.

Under that program, there are a number of organizations created to maintain our national strength to combat any aggression in the future. There are also a number of proposals to foster such maintenance even further, and there are also a great number of activities now under way or projected into the future for added assistance in the over-all task.

Universal military training has been proposed as the way of offsetting gradual loss of our reserve of military manpower. If the legislation is enacted, as a result of the plan, veterans passing beyond military age will be replaced constantly in the reserve by youngsters newly endowed with the arts of warfare and basic military training.

Similarly, as the wartime agencies required in the administration of our economy and wartime controls lose their value with passing time, they will be replaced with planned agencies and planned methods and procedures designed to meet the probable and different problems of a future emergency. These agencies, controls, methods and procedures are devised in the form of the U.S. Industrial Mobilization Plan which will be promulgated by the National Security Resources Board.

As you can readily see, through these steps, the national security planners are replacing potential before it is lost. As the value of our present potential declines, the value of the peacetime planned potential rises so that when Time has dissipated what is now in residue of World War II, what is now being created will be developed to a point that no loss will be experienced. With this method of progressive action and planning, should an emergency occur at any time, the Nation is assured of having the strength with which to defend itself.

I have devoted much space to illustrate the general pattern of how war reserves are being maintained during peacetime, but more specific patterns can be found in some of the activities of the Munitions Board, particularly in its activities for the preservation of and creation of plans for industrial potential, which will provide our Services the necessary equipment with which to fight in the event of an emergency.

Nothing is more illustrative of the preservation of industrial potential than the actual program in which the Board has been engaged to preserve the industrial capacity of numerous munitions plants in the United States, which, now—in peacetime—are surplus from our war effort.

Prior to the past war, the United States, aside from a small arsenal system, had no munitions industry, as such. Consequently, in order to engage successfully in war, a munitions industry had to be created—facilities for manufacturing aircraft, ships, explosives, ammunition loading machinery, guns and ammunition had to be built. And, to achieve sufficient production of munitions, numerous facilities for the production of iron, steel, nonferrous metals (such as aluminum), synthetic rubber, aviation gasoline and chemicals, were built or expanded.

All told, the United States spent about fourteen billion dollars in new plants and about four billion for expansions.

To indicate the importance of these facilities, without which the war could not even have been fought, I can indicate here that as of August 1945, the Government owned 99.9% of the explosives and ammunition loading plants; 93.7% of the synthetic rubber plants; 87.2% of guns and ammunition plants; 86.7% of the aircraft and aircraft component plants; 88.3% of ship construction and repair plants and 46.3% of the nonferrous metal plants in the country.

As a happy contrast, to illustrate how our economy is normally pitched to peaceful pursuits, less than 1% of the food processing plants, only 7% of plants used for the production of chemicals and petroleum products and 11.5% of the steel plants were Government financed.

From these statistics, you can immediately see that if capacities of the munitions production facilities built up to defend the Nation in World War II were not in some way protected from dissipation through nonuse or conversion, should another emergency occur it would be necessary to rebuild them, with the consequent loss of time and money. In the light of modern warfare, a nation attacked will no longer have the time required for such building. Consequently, such capacity must be maintained as part of national preparedness against future, possible aggression from its enemies.

To preserve the capacities required for the production of specialized munitions and for that amount of basic materials represented by the difference in normal peacetime production and that required to conduct a war successfully, the Munitions Board has assisted the Services in the disposition and retention of surplus war plants. The program is three-pronged.

The first method is through retention of the Army Arsenal System and the Navy's Shore Establishment twenty-five plants (in addition to the system in existence prior to the late war). These are primarily shipyards, arsenals and other specialized facilities. During peacetime, they will not operate at capacity, but only to the extent required by the peacetime Services. However, even at reduced operation, they will preserve the arts of munitions production and guarantee a substantial increment to war production which will be immediately available in an emergency.

One hundred and twenty other specialized munitions plants constitute the second component of preserved industrial potential. They are an industrial reserve, the title to which is retained by the Army, Navy and Air Force. Originally, the 120 plants cost about $2,700,000,000 to build. In peacetime, they are being held in "stand-by" condition, with the Services leasing them in whole or in part so that the cost of their maintenance will be nominal.

To avoid stiff maintenance cost and at the same time preserve the production capacity of about 170 additional industrial facilities, the National Security Clause was devised by the Munitions Board. These plants are essential to national defense and, at the same time, are extremely valuable to our national economy in peacetime. They had an acquisition cost of about $2,600,000,000.

The National Security Clause consists of a series of conditions or requirements included in the contracts of sale of each of the plants. These conditions provide that, in the event of an emergency, the plant can be rapidly reconverted to war production and that the purchaser is obligated to either accept a war production order—if willing and capable of producing the desired item or items—or relinquish it to the Government for the duration of the emergency. In fairness to the pur-

chaser, the clause provides that any purchaser, from whom a plant is taken in an emergency because of unwillingness or inability to produce the required products, will be compensated for tangible losses, paid a fair rental, and will be reimbursed for the cost of again converting the plant to his own use when the plant is returned to him.

There are a great number of beneficial by-products to the National Security Clause. In addition to its enabling the Nation to recapture the plant in an emergency—an inestimable saving in time—it assures that the plant cannot be altered in such a manner that its designed productive capacity will be destroyed. This eliminates the necessity for extensive reconversion—another great saving in essential time.

The Clause gives the purchaser a "break" in price. This reduction in price is designed to offset the cost of maintaining the plant in top condition for a number of years and for the cost of protecting machinery and designed capacity for which the purchaser may or may not have use.

The purchaser, his stockholders and employees receive a number of benefits. There is complete assurance that the plant will be operated in a war and there will be no costly delays in getting into war work—no confusion nor delays. Naturally, such expediency means that the employee will be guaranteed continuity of employment and will not be assailed with doubts as to whether or not his company will be so employed and whether or not it would be wise for him to shift in employment, losing seniority rights and other benefits.

One of the greatest illustrations of the magnitude of our war effort is the fact that during the war years the United States doubled the number of machine tools it had hitherto possessed. Prior to the war, the U.S. had installed in its factories a little more than a million machine tools and other items of metal forming equipment —without which industry cannot produce most of the country's durable goods and without which modern war cannot be fought.

Of the approximate million machine tools produced during the war, about one-quarter were sent abroad—principally to England and Russia. The remainder constituted war surplus with the end of World War II.

A great number of these machine tools were sold by the Government as part of the plants within which they were installed. A large number of other tools were vital to our national economy and were sold piecemeal to industry, one of the basic assumptions of preparedness planning being that a strong national economy constitutes a big component of any preparedness program.

However, numerous machine tools remained war surplus—not required in our peacetime economy. Without any planning, these tools would have two general fates. They would ultimately have to be sold as scrap or would fall into the hands of speculators who could ship them to countries which might use them for other than peaceful purposes.

There was but one wise solution—the creation of an industrial reserve of machine tools.

This industrial reserve was created under Public Law 364 and the Munitions Board set as a tentative goal some 92,000 general and specialized machine tools to be stored and preserved by the Armed Forces against possible future emergency. As of December, 1947, the one-third mark in the acquisition of the 92,000 tools had been reached and plans were well advanced toward raising the number of tools ultimately to be acquired by the Services in the reserve.

There is no need to elaborate on the savings in time, money, skill and effort resultant in an emergency from the preservation of these machine tools.

The preservation of plants and machine tools remaining from past war effort provides a picture of how existing war potential can be maintained in peacetime, and the program for the predetermination of sources of supply now projected by the Munitions Board can best illustrate one of the many methods of *planning* potential as past potential grows obsolete.

(The stockpiling of strategic and critical materials is highly illustrative of how *actual* potential is achieved. See "Stockpiling: A National Defense Assurance," Armored Cavalry Journal, September-October, 1947 issue.)

It is not hard to understand why the Nation cannot afford to maintain in idle stand-by condition all the specialized factories required in a modern war effort. Therefore, it must plan for the emergency use and, where necessary, the conversion of a big portion of the peacetime production capacity, especially in the durable goods industries and industries making relatively heavy articles.

Another residue of World War II beneficial in industrial preparedness are the comprehensive records of the production by specific factories. These records are highly useful as a register of proven sources of supply. They will continue, for a time, to be valuable, but like all the rest of our war potential left over from our last war that value will diminish as time goes by.

Business will change. New processes are being and will be developed. New products will replace products which will become obsolescent—discarded from the list of war requirements.

Similarly, military requirements will change. Scientific development, the introduction of light metals, atomic energy and guided missiles will cause vast revisions in our war requirements. All these tend to reduce the value of existing records of supply sources and make it mandatory that new records be developed and constantly maintained.

For many months, now, the Munitions Board has been working on this oversized task, and, at this time, plans for the methods and procedures necessary are tentatively completed. The actual leg-work in this long-range program to develop new lists of prospective suppliers is projected to start sometime this year.

The program is generally called the "allocation of privately owned industrial capacity."

Based upon the best estimates of military requirements in any future emergency the Munitions Board will attempt to apportion the estimated wartime manufacturing load to the facilities which appear to be most readily adaptable for the production of wartime material requirements. The Board anticipates allotting to a specific plant only such items as the management thinks it is capable of producing.

Here is the way it works. From the records on hand, which are constantly being revised with new information gathered by the Armed Services, the Board has assembled a list of prime contract sources of supply, the list numbering between ten and fifteen thousand facilities. The procurement planning agencies of the three Armed Services request allocation of these capacities for the production of specific items of supply. After taking into account the production potential of the facility and the importance of the planned procurement, the Munitions Board, allocates such capacities as it deems best for national defense. Some capacities may be allocated to two or more services; others to a single service.

After the allocations have been made, Procurement Planning Representatives of the Services will go to Industry with their tentative wartime shopping lists.

Since the program is entirely voluntary from the standpoint of the manufacturer, he does not have to cooperate in this operation if he does not choose to do so. However, from the excellent reception received by the Armed Forces from Industry, the Board is optimistic that the Service representatives will be well received and given every assistance.

The Service representative will probably show the manufacturer several items desired in an emergency and permit him to select the item which he thinks he is most capable of producing in the desired amounts.

After the selection has been made, the management and Service representative will discuss production problems, including raw materials and manpower. With this groundwork accomplished in peacetime, in the event of an emergency, all there is left to do is award the contracts and let industry produce.

Of course, all the work accomplished in this effort must be constantly revised and maintained up to date.

New war plants and the production capacity for the output of goods for the civilian economy during an emergency have not been overlooked in the planning.

In some instances, especially with new and radically different items of supply required in large numbers, it may prove to be more effective to build new plants rather than reconvert an existing facility. However, every effort will be made to utilize existing facilities —avoiding disadvantageous consumption of months of precious time for construction and initiation of operation in new plants, along with the consumption of materials, services and labor required in new construction.

There are a great number of other plans and activities hinged to the over-all effort of sustaining and/or replacing and improving our national war potential. However, since space is limited, it is best to settle for the foregoing which are illustrative of the over-all effort to achieve and hold a potential which will discourage any "would-be" aggressor in the future.

Consequently, the reader can be assured that the United States has a good war potential, and one which, if we remain alert and active, will grow increasingly more potent in the future. Strong enough, we hope and pray, to sustain world peace.

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BOOK DEPARTMENT

Armored Cavalry Journal

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Armored Cavalry of the Present—and Future

*by Colonel Paul A. Disney**

This article by a member of the G-3 Section at Army Ground Force Headquarters constitutes a part of the active comment resulting from General Gavin's *The Future of Armor* published in our last issue. In presenting this objective material to its readers the Armored Cavalry Journal feels it is serving one of its outstanding responsibilities—that of supplying an impartial medium for the discussion of important military subjects by those whose opinions hold weight.

THE lesson for today, gentlemen, is: Should all tanks be designed to be flown into battle?

The text reference is: Aesop's Fable, "The Dog and the Bone."

A dog with a very satisfactory bone in his mouth found it necessary to cross a small stream on a footbridge. Upon looking into the still water, he saw what appeared to be another dog with a much better bone. In an understandable effort to "improve his lie" he immediately opened his mouth to seize the bone from the other dog. In so doing, the bone which he already had, dropped from his mouth and sank to the bottom of the stream.

Motto: Hang onto what you have until you know that what you are reaching for is a reality.

In the November-December, 1947, issue of the ARMORED CAVALRY JOURNAL, there appeared an article written by Major General James M. Gavin, Commanding General of the 82d Airborne Division. In this article, General Gavin expounds the theory that armor (tanks) of the future must be of such design as to enable them to be transported into battle by aircraft. The article leaves the impression (possibly unintentionally) that we must throw overboard considerations of tanks heavier than those which will be capable of air lift. Such theories should be provocative of considerable thought on the part of all present and future commanders, particularly to those who feel that the need of armor has passed, together with other troops who have the prosaic job of fighting on the ground.

Aside from any discussion on the feasibility of designing *effective* tanks that will be capable of being carried into battle by present or future aircraft, General Gavin's concept of the employment of armor is an extremely welcome one to armored cavalrymen, coming, as it does, from an officer with an enviable war record gained in extensive, actual combat, and a recognized authority on the art of vertical envelopment and exploitation.

It is welcome because it acknowledges the value of armored cavalry in the exploitation role. Exploitation can only take place when properly organized and equipped forces, possessing mobility, protected fire power, and shock characteristics (armored cavalry), have reached enemy rear areas.

By utilizing air transport for vertical envelopment, thus avoiding the necessity of first penetrating or en-

*G-3 Section, Headquarters AGF.

veloping enemy ground positions in order to reach his rear, the armored cavalryman will find himself in a position to carry out the exploitation mission in a matter of perhaps minutes, rather than days.

These are thoughts for the future, and, in the light of past experience, we may expect them to be fully realized. We must hasten the day of realization with every effort possible.

However, for those who are charged with the protection of our country in the inescapable present, the cold, hard, unavoidable facts remain, that based on present technical "know-how," non-availability of funds, materials, and a myriad of other considerations, there must remain in existence the much more prosaic type of tank of the present. These are the tanks which must operate in conjunction with the infantry to destroy the enemy, and in the armored divisions to initially break through the enemy positions to reach his rear for exploitation purposes (and also to link up with the airborne divisions on the ground).

The unassailable fact remains that in a fight, a good big man will generally defeat a good little man. The temporary advantage gained by the little man in providing himself with a knife or gun is rapidly offset when the big man does the same.

So it is with tanks. Our tank specifications will be greatly influenced by the type of tank the enemy can place against us in the field. Enemy tanks possessing sufficient armor (either in thickness or strength) and type armament to permit them to roam about on the battlefield with impunity must be combatted by tanks comparable in armor and armament. If the enemy uses a tank weighing 100 tons, assuming that such a tank makes full use of strength-giving alloys, and all the technical skills that we must assume the enemy will have, then we will be opposing them with a tank which, willy-nilly, must be of the same weight, whether we like it or not. Let this statement not be construed as indicating that any thinking armored cavalryman desires a tank behemoth—but simply as a statement of cause and effect.

So, to answer the lesson question:

First—Let us design a tank that may be flown into battle, either whole, or in parts.

Second—Let us continue to develop our present tanks with the idea of making them better than any tank or weapon the enemy may pit against them, regardless of whether this requires a 100-ton tank, or a 200-ton tank, or only a plastic tank.

Finally, let us keep what we have and make full use of it. Never let us be satisfied with what we have, however. Look into the future with an extremely critical eye. *In other words, don't drop the bone until we are sure we are getting a better one.*

The New Year opened with a grand round of effort by Mother Nature. She can be counted upon to continue to spot some unfortunate section of the land throughout the entire year.

Always first on hand with relief for the victims of flood, tornado or blizzard is the Red Cross. The ability of this fine organization to aid the suffering lies in the voluntary contributions of its supporters. Help if you are able.

For Code Practice at The Armored School

—A MECHANICAL BRAIN

by Captain Madison W. Thomas
and Technical Sergeant J. Paul Brown

THE control center for International Morse code instruction at The Armored School is locally called the "Mechanical Brain."

The "Brain" was designed to service six classrooms, which were in use during the war, although only two classrooms are in use as such at the present time. In case of future emergency, the four closed classrooms could be reopened in a matter of hours. The "Mechanical Brain" is capable of servicing as many code rooms as are required.

This "Brain" is located in a 12- by 20-foot room in the Communication Department area. In the center of the room is the control panel, four feet wide and eight feet high. The control panel is a maze of whirling wheels, flashing tubes, and wires leading in and out of a patching board. In the background may be heard the "dits" and "dahs" of International Morse code from the monitor speaker. The control panel consists of six Keyers, TG-10 (a Signal Corps device for converting an inked tape to audible Morse code), which are mounted on either side of the control panel. The Keyers, TG-10, have been modified by the addition of a tube in the circuit of each to permit transmission of jamming signals in conjunction with the code being sent to the various classrooms. This is in keeping with the school policy of realism in all instruction. In the top center of the control panel is located the electronic keyer, a device designed and constructed by enlisted personnel of this Department to provide lessons from a single tape. Located at the bottom of the control panel are four oscillator amplifiers which supply a tone for use by students in transmitting practice.

In the middle of the control panel is the patching board where any one or all of the 12 Keyers, TG-10, may be wired in with any combination of code classrooms. Each of the classrooms is provided with 10 clear channels to the "Brain." Normally, nine speeds of code and one of tone are sent to each code classroom.

Directly below the patching board is the monitor amplifier which makes possible the monitoring of all transmissions by merely turning the switch to any one of its twelve positions.

The 12 Keyers, TG-10, transmit code at varying speeds from five to 20 words per minute. The individual characters are identical at 5 words per minute and at 20 words per minute; only the spacing between characters varies. For example: On the Boehme Keyer, 60 inches of tape contains 100 characters at 20 words per minute and 25 characters at five words per minute. *Within these limits the characters are always exactly the same, regardless of speed.*

Accuracy of the sound picture of each character is important, particularly in the early stages of instruction. Since no human hand can transmit absolutely perfect code, teletype perforator machines are utilized for this purpose. This is a commercial machine with a standard typewriter keyboard which produces a perforated tape.

This perforator staggers the perforations in the tape in such a manner that the proper Morse code equivalent for each letter or numeral will be produced when the tape is passed between two exciter lamps and two photoelectric cells of an O. H. Boehme keying head.

One exciter lamp and one photoelectric cell are used in conjunction with the perforations in the upper half of the tape for starting the tone, and the other exciter lamp and photoelectric cell are used in conjunction with the perforations in the lower half of the tape for silencing the tone, thereby producing the desired "dits" and "dahs."

The audio tone from the Boehme keyer is piped through the patchboard to a McElroy inker. This inker is activated by the audio tone from the Boehme keyer in such a manner that a stylus is moved up and down in synchronization with the audio tone from the Boehme keyer, thereby inking a tape as it is pulled through the inker. A *perfect* tape can be made.

The electronic keyer is used in conjunction with the Boehme keyer in transmitting "Z" lessons. The 26 letters of the alphabet and the numerals 1 through 0 (a total of 36 characters) are divided into six lessons of six characters each. These six lessons are called "Z" lessons.

A perforated tape is cut with groups of six characters each. By means of the electronic keyer, the first character of each group is selected from the tape and sent

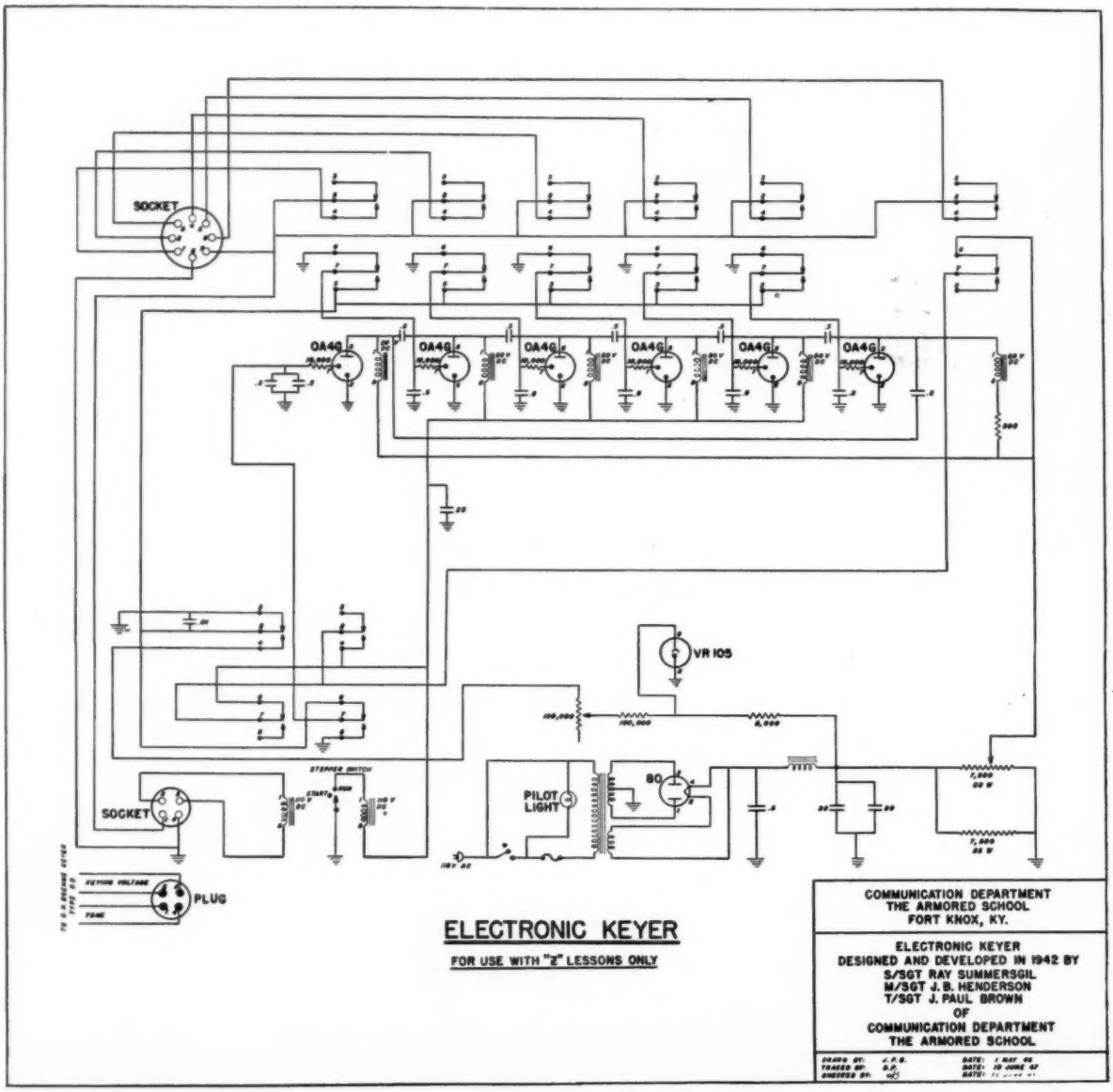
over line No. 1 as "Z" lesson No. 1. The second character of each group is extracted and sent over line No. 2, as "Z" lesson No. 2, etc., through the six characters of a group, thereby providing six separate transmissions, or lessons from each tape.

This electronic keyer contains six gas triodes and eight double pole-double throw relays. One double pole-double throw relay is a keying relay and is keyed by the space voltage furnished by the Boehme keyer.

When the keying relay is closed, a starting voltage is present at the starting anode of the first gas triode. The keying relay must stay closed long enough for two .5 mfd condensers to charge before the first gas triode* will fire. This will occur only between groups. The space between individual characters or between the "dits" and "dahs" within the characters will close the keying relay; however, it will not stay closed sufficiently long to charge the two .5 mfd condensers present at the first triode and consequently will not fire the tube. Only the space between groups is of sufficient time length to charge both .5 mfd condensers and fire the first tube. The space between groups is three times as long as that between individual characters.

When the first tube fires, its double pole-double throw relay is held down, thereby closing the circuit for the first character in the group which will go out on line No. 1 and at the same time placing the starting voltage on the anode of tube No. 2. Tube No. 2 has only one .5 mfd condenser; so the space between characters is of sufficient duration to charge the condenser and fire tube No. 2. The space between the "dits" and "dahs" does not hold the keying relay down long

*The gas within the tube is ironized, and the circuit is completed between cathode and plate, allowing current to flow.



enough to charge even one .5 mfd condenser.

The double pole-double throw relay of tube No. 2 is closed and tube No. 1 is extinguished by the firing of tube No. 2. The double pole-double throw relay of tube No. 2 allows the second character of the group to go out on line No. 2 and places a starting voltage on the anode of tube No. 3. The process continues throughout the six tubes.

When tube No. 6 fires, it removes, by means of its double pole-double throw relay, the plate voltage from the interlock relay, allowing it to return to rest. The first tube will then fire when the space between groups comes through.

The design of tube No. 1 allows it to fire only on the space voltage between groups, and the first character of any group is always sent on line No. 1 and consequently the second on line No. 2, etc.

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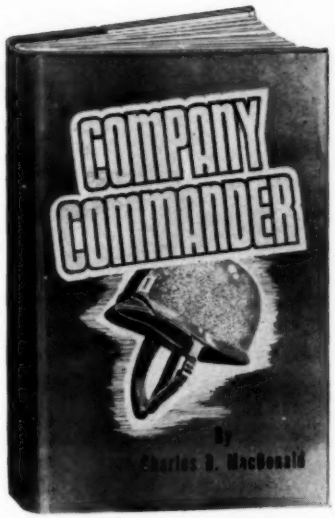

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Editorial Comment

The Army Equestrian Team, together with Colonel Andrew A. Frierson, U.S. Army, took six first places in the 14 events of the National Horse Show at Madison Square Garden in November, 1947.

Colonel Wing on Democrat started the ball rolling on the afternoon of November 4, taking first place in the International Military Preliminary. Lieutenant Colonel Henry took second with Mexico and Canada taking third and fourth.

The Army Equestrian Team did not place in the Military Touch and Out event, however Colonel Frierson did place fourth in this event.

In Class 115A, First Event Low Score, with two officers each riding two horses, Colonel Henry on Rascal and Roll On; Captain Burton on Airmail and Outcast; two of our horses were eliminated for three refusals placing them fourth with 74½ faults. Mexico took first place with 12 faults.

The Dakota Trophy was won by Mexico with Swizzlestick, ridden by Lieutenant Colonel Symroski, and Colonel Frierson's mount placing second. Ireland was in third place and Airmail ridden by Captain Burton tied with Mexico for fourth.

In the next event which was held on the afternoon of the sixth, the Second Event Low Score (Pairs), Mexico again took first place with Lieutenant Colonel Symroski on Gambler and Captain Burton on Outcast tieing Ireland for second place.

Class 114, The Stratosphere, which consisted of eight obstacles five feet high, was won by Swizzlestick, ridden by Lieutenant Colonel Symroski, with Canada and Mexico placing second and third respectively.

Third Event Low Score, three horses in tandem, held on the afternoon of the 7th, Mexico came out in front with United States and Ireland tieing for second place. Canada took third in this event.

In the Class 115 Finals, Mexico was first, Ireland second, Canada third and the U.S. fourth.

Tortilla, ridden by Colonel Wing came through in Class 116 to win the Bowman Challenge Cup. This is the third time that Colonel Wing has won this cup, and it will be retired in his possession. Rascal, ridden by Lieutenant Colonel Henry, took second place with Mexico taking third and fourth.

In the Whitney Stone Special (fault and out), Swizzlestick, ridden by Colonel Symroski, took first place and Airmail, ridden by Captain Burton, took second to tie with Mexico. Democrat, ridden by Colonel Wing, tied Colonel Frierson for third place.

In the Class 111 for the International Good Will Trophy, Swizzlestick was again out in front and Airmail, ridden by Captain Burton, took second place; third and fourth place going to Mexico.

The $1000 Military Stake was won by Mexico with Airmail, ridden by Captain Burton, taking fourth.

Airmail, ridden by Captain Burton, came through in the following event, the International Individual Challenge Cup, to take first place, retiring the trophy for the U.S. It was won by Colonel Wing in 1941 and again by Colonel Wright in 1946. Lieutenant Colonel Symroski on Swizzlestick came in third in this event.

The International Perpetual Challenge Trophy is a team competition event, with four horses per nation and the best three scores to count. Mexico, Ireland, and Canada were clean on the first round. However, in the jump-off Mexico took first place, Ireland tied the U.S. for second place and Canada took third. Democrat, ridden by Colonel Wing, was clean on the first round and had one fault on the jump-off. Roll On, ridden by Lieutenant Colonel Henry, was clean on the first round and the jump-off. Swizzlestick, ridden by Lieutenant Colonel Symroski, was clean on the first round and had one fault on the jump-off. Airmail, ridden by Captain Burton, was eliminated by fault on the first round.

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OTHER BRANCHES

Major General Alden H. Waitt

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(Editor's Note: All members of "Other Branches" are encouraged to contribute to this section of the ARMORED CAVALRY JOURNAL. *The "Other Branches" section in the next issue will feature a statement by the Executive for Reserve and ROTC Affairs and a lead article on the current activities of the Organized Reserve Corps.)*

The world of chemistry in war is the province of the Chemical Corps. One of the younger branches of our Army, it has steadily advanced in skill and versatility to meet the growing needs of our armed forces. In World War II, it stood ready to match or surpass any chemical weapon our enemies might have used against us. It works now for peace by maintaining the highest possible degree of readiness in its special weapons, for it is this readiness which is the most certain guarantee that they will not be used against us.

The weapons which are the concern of the Chemical Corps are essentially anti-personnel weapons, with the exception of incendiaries. This fact is one which merits the fullest consideration in our outlook on future warfare. The war from which we have just emerged emphasized means of material destruction. It is true that the devastation of the enemy's cities in attack upon his vital economic structure contributed materially to victory and hastened the end of hostilities. But, as we well know, the cost of such war to the victor does not end necessarily with the last bomb dropped. Indeed, the victorious nation, concerned alike with the vanquished in the recovery of world economy, may have to contribute heavily from his own material resources in bringing that recovery about.

Hence the thought that the victor in war, even the defeated nation, might be better off, when it is all over, if the means of war were such as to produce casualties without the wholesale destruction of housing, factories and machinery, so difficult and costly to replace. This is not a pleasant thought but, for that matter, neither is any form of warfare. In our outlook on war, I feel we should be hard-headed in our assessments and give consideration to dollar costs, not only as to the waging of war, but in the postwar rehabilitation.

The field of chemistry offers promise of potent, relatively cheap weapons, essentially anti-personnel weapons which do not leave a wake of material destruction. It behooves all military men to give thought to these offensive possibilities. It is the business of the Chemical Corps to consider them along with ways and means of defense against them.

Major General, U. S. Army,
Chief, Chemical Corps

CHEMICAL CORPS

History And Accomplishments Of The Chemical Corps

*by Major General Alden H. Waitt**

ON April 6, 1917, when the United States entered World War I, this country had no chemical warfare organization, no military gas masks or other provisions for dealing with gas warfare despite the fact that gas had been in use in the war for almost two years.

On the day that the United States declared war on Germany, a research committee was organized under the direction of the Bureau of Mines, and shortly thereafter the study of gas warfare in this country began. During the first half of 1918, there were five separate agencies of the United States Government more or less directly responsible for chemical warfare. The Bureau of Mines was charged with research and development, both offensive and defensive; the Medical Department was responsible for the manufacture and supply of protective materials and for the training of personnel in gas defense; the Ordnance Department manufactured toxic gas and filled chemical shell; the Signal Corps provided gas alarms; and the Engineers had special gas troops to conduct offensive operations. Obviously, such divided responsibility for chemical warfare was not effective, so on June 28, 1918, these various activities were combined into one service, the Chemical Warfare Service, National Army. This new service was charged with all responsibilities relating to research, development, testing, and procurement of toxic gases and gas defense appliances; the filling of gas munitions; all chemical warfare training; and the formulation of doctrine governing the employment of toxic agents. The Chemical Warfare Service, A.E.F., became the European Division of the newly established Chemical Warfare Service.

Though the Service was established at a relatively late date in the War, its accomplishments were impressive. The entire Army was provided with protective equipment and trained in defense against gas attack. Chemical officers were trained and placed on the staff of all army, corps and division commanders as specialists in both offensive and defensive gas warfare.

Prior to the Marne-Vesle operation, the First Gas Regiment fought with British forces and participated in the attack on Lens, during which attack 2,500 projector drums were fired and almost 40 tons of gas were hurled on German troops. This was the largest scale gas operation carried out by the Allies up to that time. During the Marne-Vesle operation and continuing through the St. Mihiel and Meuse-Argonne offensives that brought an end to the war, the Regiment supported both the Tank Corps and the Infantry. Using Livens projectors and Stokes mortars, the Regiment conducted 152 gas operations in which they fired not only phosgene, mustard, chlorpicrin and other toxic gases but also smoke and thermit, a liquid metal.

Equally outstanding were the accomplishments in the fields of research, development and supply. American protective equipment and training in defense against gas attack were so effective that less than two per cent of American gas casualties proved fatal. The U.S. forces were provided with approximately 6,000,000 gas masks; thousands of tons of decontaminating materials and protective ointment; and nearly 600,000 gas-filled shells. In addition, gas for filling 5,000,000 shells was shipped to France and Great Britain. At the time of the Armistice, gas for filling an additional 4,000,000 shells was on hand, and production had reached an annual rate of 42,120 tons—equal to the combined production of France and Great Britain and nearly four times that of Germany.

From a peak strength of 1,680 officers and 18,838 enlisted men in World War I, the Chemical Warfare Service was reduced, at one time, to a total strength of

*Chief, Chemical Corps.

361 officers and enlisted men. The all-time low for officers was 60 and for enlisted men 280. As late as December, 1939, the total military strength of the service was only 917. In the meantime, Italy had employed gas against the Ethiopians, Japan was reportedly using it against the Chinese, and Hitler had abundantly demonstrated his total disregard for all international agreements.

At the time the United States entered World War II, the Chemical Warfare Service was charged with the responsibility for the research, development, procurement and supply to the Army of smoke and incendiary materials, all toxic gases and gas defense appliances, the supervision of the training of the Army in both defensive and offensive Chemical Warfare, and the operation of special gas troops. While the use of toxic gases was not initiated during the recent war, the enemies' capability was at all times beyond question, and their intention was uncertain until the very end of the war. There was, therefore, no alternative for the United States Armed Forces but to be continuously ready for all-out gas warfare. Such readiness was the responsibility of the Chemical Warfare Service. To this end chemical officers were trained and assigned as special staff officers at the headquarters of every theater, army group, army, corps, division, base command or base section, and to the command of each of the approximately 375 chemical units, air and ground, which were activated during World War II. By July 1945, a total of approximately 350 chemical units (4.2 chemical mortar, smoke generator, decontamination, processing, depot, base depot, maintenance, laboratory, composite, general service, air operations, air depot and air maintenance units) were employed in theaters of operation. The peak strength of the Chemical Corps in World War II was approximately 70,000 officers and enlisted men.

A flame throwing tank does its stuff against a Jap position in the Southwest Pacific.

Signal Corps Photo

Undoubtedly the most famous of the Chemical Warfare ground weapons employed in the recent war was the 4.2-inch chemical mortar. Chemical Mortar Battalions armed with this weapon first saw action in the Mediterranean Theater in July, 1943, and two months later they went into action in the Pacific.

The first battalions landed in Sicily with a newly developed high explosive shell for their 4.2-inch chemical mortars in addition to their standard smoke shell. The mobile mortars were on the beach in the first waves of the assault and in action minutes later, laying massed fire with white phosphorus and high explosive on enemy troop concentrations, on pinpoint targets such as tanks, machine gun nests and pillboxes, and particularly on enemy weapons in defiladed positions. Thereafter the mortars moved with the Infantry up the boot of Italy and into Southern France. Four Chemical Mortar Battalions were employed in the Normandy campaign. Two of these went in with the assault on D-Day and supported the infantry until artillery could be landed and brought into operation. The battalion which landed on Utah Beach was the only "artillery" support of the 4th Infantry Division for six hours after the landing.

In the South Pacific, mortars were used in the drive from Guadalcanal up the ladder of the Solomons; in perimeter defense on Bougainville, were mounted on LCI's for approach assaults in the landings on Peleliu, Leyte and Okinawa, and again on LCI's, pounded the shore in the assault landings at Lingayen Gulf in Luzon.

Chemical mortar units were also attached to armored units, including cavalry groups, on numerous occasions. Since the mortar troops were equipped with neither motorized mounts nor any type armored vehicle, this type operation was very exhausting and hazardous, and chemical mortar units could not realize their true capabilities in this type employment.

That these were combat troops and elements of the attack and front-line defense is indicated by the fact that they experienced a higher ratio of men killed in action than any other branch of the Army except the Armored Cavalry, Infantry and air crew personnel of the Air Forces.

While the 4.2-inch mortar undoubtedly became the best known weapon of the Chemical Corps to the ground forces in World War II, it was only one of a thousand items of research which have been developed during the relatively brief history of the Corps. The scope of research necessary to carry out its mission has become ever wider with time, so that today, while the primary function of the Chemical Corps is still gas warfare, it has also become responsible for the research and development and the training of our Army in incendiary warfare and other special forms of warfare not delegated to other branches of the service. At no time, however, has the Chemical Corps forgotten for an instant the experience and lessons of gas warfare learned

in the First World War.

When World War II began, it seemed only a matter of time before gas would be used in the conflict. As the only chemical service in our armed forces, the Chemical Corps was responsible for furnishing the Navy, Marine Corps, the Army Ground and Air Forces with equipment, personnel and training in this highly specialized form of warfare. In preparation for just this event, the Chemical Corps had developed four major items in the years between wars. The first of these was the rifled 4.2-inch mortar, which extended the range of the original smooth-bore Stokes mortar from 1,400 yards to 2,400 yards and vastly improved its accuracy. A shell had been developed for white phosphorus or chemical filling which had far greater capacity than any similar caliber artillery shell. The second item was a smoke and chemical spray tank for airplanes, making possible chemical attack from the air or laying quickly dense clouds of smoke for screening purposes, tactics unheard of in World War I. The third item was impregnated clothing, for protection against mustard gas; and the fourth was a fully molded facepiece for the gas mask, which replaced the awkward and uncomfortable facepiece used in earlier masks.

These were important developments but they were not enough, and to undertake the vast amount of research suddenly demanded by war, the Chemical Corps expanded its technical and scientific personnel from 300 to more than 5,000 people; built new chemical and medical laboratories in Maryland, new arsenals in Colorado, Alabama and Arkansas; and established new proving grounds and test installations in Utah, Mississippi, Florida and in the Panama Canal area. Special laboratories were established at the Massachusetts Institute of Technology, Columbia University and the University of Chicago, and field test units in Alaska, Canada, Great Britain, Australia, New Guinea, India and in the Philippines. The Chemical Corps turned for help with its special problems to the pool of mobilized technical resources in the Office of Scientific Research and Development. Results of basic research carried out under OSRD auspices were sent to the chemical warfare laboratories, industrial development laboratories and plants, to be turned into equipment, munitions and devices which the troops in the field could use.

In the first part of the war, the Chemical Corps concentrated on getting ready for gas warfare. Thirty-five million gas masks were made; civilian masks, infant respirators, service masks, assault masks, optical masks, and masks for hospital patients with head wounds. Gas masks for dogs, horses and even pigeons underwent further development and were placed in production. Collective protectors, eye shields, protective capes, hand decontaminating apparatus and 300-gallon decontamination trucks, bleach and DANC, greatly improved protective clothing, protective ointments, gas casualty and gas treatment kits and water treatment kits were produced on a large scale and shipped overseas to the theaters of operations to be ready in the event of the initiation of gas warfare by the enemy.

At the same time that research, development and production of defensive material was going on, the Chemical Corps also manufactured great quantities of the war gases. Chemical mortars, gas-filled mortar and artillery shells, bulk agents, chemical spray tanks and aerial chemical bombs were stored in the overseas theaters available for any eventuality. Bombs developed to carry chemical agents ranged from 10-pound mustard-filled bombs to 2,000-pound bombs for delivery of crash concentrations of nonpersistent toxic gases. Toxic smoke candles, thermal generators and a variety of grenades and rockets were also designed to carry chemical fillings. Thirty- and 70-gallon airplane spray tanks were available for spraying liquid gases, and large stores of chemical shell were prepared for the 75mm, 105mm, and 155mm artillery weapons. However, the most effective ground chemical weapon for gas warfare was the 4.2 mortar with its shell fillings of mustard, phosgene and other toxic agents.

The original 4.2 mortar was purely a chemical weapon for the firing of gas and smoke. As such, it would have had limited usefulness for our ground forces in the absence of gas warfare. But in 1942 the Chemical Corps developed a shell in which the chemical or smoke filling was replaced by eight-and-one-half pounds of TNT, representing almost 35 per cent of the total weight of the round, an extremely high loading efficiency for any munition. The range of the mortar was steadily advanced from 2,400 yards to 3,200 yards to 4,400 yards as continual improvements were made in the powder charge, ignition and in the structural features of the weapon. In combat, despite these authorized ranges, missions were fired at ranges up to 5,000 yards. While capable of these extreme ranges, the inherent accuracy of the weapon and short minimum range of less than 600 yards enabled the 4.2 mortar units to walk the fire safely to within less than 100 yards of our front-line troops, a feat that proved most useful in perimeter fighting in the jungle.

From the standpoint of strategic operations, the most important chemical munition was the incendiary bomb. In 1941 the only standardized aerial incendiary in our Army was a 100-pound gasoline-filled bomb. When the war ended, the Chemical Corps had developed a two- and four-pound magnesium bomb, a six-pound Napalm bomb, a 10-pound pyrotechnic gel bomb, the 100-pound jellied oil bomb, and the 500-pound pyrotechnic gel bomb. Each designed for a specific fire mission, the Napalm filling was an aluminum soap-thickened gasoline mixture, jellied oil was a synthetic rubber-like inflammatory composition, and pyrotechnic gel consisted of magnesium fines and kerosene in an asphalt matrix. Almost 260 million of these incendiaries were procured for use by the Army Air Forces. Aerial incendiary warfare, initiated over Germany, hit its stride in the Pacific theaters where it was on such a large scale that Chemical Corps Air Operation Companies at Air Forces

bases worked around the clock on three-shift schedules loading clusters into the bomb racks.

Where streamlined incendiary bombs, their special fillings, and their effective employment were products of long research and experimentation, the fire bomb as a tactical incendiary was developed from a field improvisation when fighter pilots dropped their spare jettisonable wing tanks and ignited the splashed gasoline with tracer bullets. When the Chemical Corps attached white phosphorus grenades to the tank and substituted Napalm as the incendiary filling for the high octane gas, the fire bomb promptly graduated from a field expedient to a finished munition. Almost 40,000 fire bombs ranging in capacity from 30 gallons to 300 gallons were dropped on point targets in Europe and in the Pacific.

Of the smaller type incendiary weapons developed for the use of ground troops, perhaps the most widely known was the white phosphorus grenade. Although white phosphorus was originally developed as a smoke material and was used in bombs, artillery shell and the 4.2 mortar shell principally to build smoke screens, the splatter of burning particles as the white phosphorus grenade bursts made it an excellent antipersonnel weapon for the throwing arm of our troops.

The most effective weapon in the United States Army for dealing with the Japanese log and coral bunkers and caves was the flame thrower. The portable and mechanized flame throwers saved countless American lives in the Pacific. The Germans had introduced this type weapon in World War I, and it was employed both by the enemy and our own forces. The results were generally unsuccessful, and it was held in general disrepute in the American Army. For this reason the Chemical Corps was not allowed, prior to 1941, to pursue research and development in this field. Early in 1941, however a development program was begun and a new portable flame thrower was standardized in the following August. Just before Pearl Harbor a contract was let for 1,000 of these comparatively new weapons.

After successful demonstration against Japanese defenses on Guadalcanal, development of the flame thrower was given top priority and new models, new firing systems and more important, new fuels were devised. The gas and oil composition first used created a great billowing cloud of flame and smoke that enveloped the target but couldn't penetrate it. With Napalm-thickened fuels, however, a rod of fuel was projected which would enter the portholes of the bunker.

The mechanized flame thrower, mounted either on the M-3 medium tank or the tank destroyer, saw more action in Europe than did the portable flame thrower. Ground commanders liked the armored protection afforded operators of the tank-mounted flame gun, and the flame-throwing tank added a new and special weapon to the modern armored force. With a much larger fuel and propelling system mounted in a tank, the mechanized flame thrower had far longer burning time and considerably more range than the portable weapon.

The flame gun originally designed for tanks was fixed in the bow machine-gun mount. Later, at the request of the Armored Forces, a periscope-mount flame gun was designed which did not require replacement of tank armament. However, the limitations of this auxiliary flame thrower in duration of fire and range pointed up the superiority of the main armament type flame gun, and new armored vehicles specifically designed for flame operations and carrying the latter type flame thrower, were under development at the end of the war. The principal employment and much of the development, especially of the mechanized flame thrower, took place in the Pacific Theater.

The importance of the flame weapon in armored operations is indicated by the increasing use made of these special tanks in the Pacific war. Auxiliary mechanized flame throwers, complementing the tank's standard armament, numbered six on Guam, 10 on Luzon, 42 on Iwo Jima and 72 on Okinawa. Main armament tank flame throwers, installed in the main gun port of the light and medium tanks, numbered 24 on Saipan and Tinian, six on Peleliu, 10 on Leyte, eight on Iwo Jima and 54 on Okinawa.

Typical of a mechanized flame thrower operation was the attack on Rocky Crags near Hill 178 on Okinawa. From caves, pillboxes and concrete emplacements built into its sides, an enemy force of almost 300 Japanese clung tenaciously to the 450-foot coral hill. The attacking elements of the 17th and 184th Infantry Regiments, encountering fire from rifles, light and heavy machine guns, 50mm and 81mm mortars and knee mortars, together with the 75mm and 15cm artillery, had taken the ground approaches to the Crags, but

Armed with a Chemical Corps flame thrower an infantryman on Iwo Jima advances into the mouth of a cave suspected of housing Japs.

Signal Corps Photo

progress was slow and perilous. On the fifth day of the attack, April 24, 1945, the tanks were called up, and an infantry battalion, supported by 105s and 60mm mortars and with 18 standard tanks and six flame tanks, was given the job of securing the Crags. Advancing toward their objective, the flame tanks opened up as soon as they came within range, repeatedly flooding nearly the whole peak with liquid fire. Resistance broke in the face of the flame attack and infantry assault platoons, following the tanks, moved up the Crags and finally took the position.

In other assaults in the Pacific, where the jungle was impenetrable to the foot soldier or where the construction of cave and bunker defenses was too intricate or massive for team assault, the mechanized flame thrower was called on to clear the way. When infantry advances disclosed enemy positions, armored bulldozers, supported by tank and infantry fire, prepared a road to enable the flame tanks to advance on the stubborn positions.

An emplaced flame thrower was developed for use on airfields against airborne landings by the enemy. The aeroflame, a flame thrower mounted on a plane, proved to be practical enough but was not required because the jettisonable fire bomb could do the same job better.

The wartime development of smoke screening devices and tactics by the Chemical Corps represented a tremendous advance over those employed in World War I. In addition to the bursting-type smoke agent, white phosphorus, screening smokes were also produced with HC (hexachlorethane) mixture, a burning-type agent; FS (sulfur trioxide-chlorsulfonic acid), a liquid for spraying; and steam and crude oil which produced an artificial fog which was extremely stable.

Smoke shells and hand grenades, smoke pots, a 30-pound and a 100-pound smoke bomb, and the smoke spray tank were available for dispersing these agents when war began, but smoke rockets, signal smokes, smoke rifle grenades, base-ejection shell, and the aerosol mechanical smoke generator were all either wartime developments or were items radically improved during the war.

A whole series of colored smokes, in red, yellow, orange, green, violet and black, were devised as fillings for hand and rifle grenades and rockets. Other signal devices were the smoke marker and the smoke streamer bomb, used principally in parachute deliveries and as target markers.

White phosphorus shell was filled for the mortars, guns and howitzers of the infantry and artillery. White phosphorus shell fired by the 4.2 mortar alone totaled over a million rounds.

While these munitions and devices provided means for laying tactical screens, the development of long-range bombers which could fly far behind the combat zones to attack our strategic installations raised a new problem in smoke operations. To provide large-scale concealment for such installations—the cities, harbors, factories and marshalling yards where the materials of war were being manufactured or assembled—an artificial fog was necessary.

Soon after the attack on Pearl Harbor smoke generator units, equipped with stationary oil generators, were organized for the protection of critical areas and installations in the United States. These units were able to completely obscure large areas within 20 to 30 minutes—but this was too slow. Consequently, NDRC personnel working with the Chemical Corps soon produced a mechanical fog oil generator which emitted a greater volume of more durable smoke in less than half the time required by previous generators. These were rushed to the North African theater where, along with smoke pots, the ports of Oran, Algiers, Bone, Bizerte, Palermo, and Naples were screened with amazing success. These ports were completely obscured within 10 minutes after the "make smoke" order was given and rarely, if ever, did the enemy air force hit a target when so obscured. This type employment of smoke was not "in the books" prior to 1942.

A U.S. Chemical Company covers an area in France with smoke.

Signal Corps Photo

Another use of smoke which was not a part of prewar doctrine was large area screening in front-line areas. Chemical officers, however, were soon faced with the critical demand for protection of American troops and supplies on beachheads, in river crossings, bridge construction, troop concentrations and main supply lines near the front. Smoke screens on the Salerno and Anzio beachheads, at the crossing of the Volturno, the Meurthe, the Roer and the Rhine rivers, and numerous screens for Engineer bridging operations saved literally thousands of lives and vast quantities of indispensable matériel. The extent to which smoke generators were employed is indicated by the fact that more than 12,000,000 gallons of fog oil were expended in the Mediterranean and European theaters.

Research and testing have from the very first been primary considerations of the Chemical Corps. Of comparable magnitude, however, was the training mission

of the Corps. Preparations for gas warfare were not complete with the manufacture and distribution of toxic agents, protective equipment and the deployment of chemical troops. In addition to the training of all personnel under its own jurisdiction, the Chemical Corps was responsible for supervising the training of the personnel of all other branches of the Army in defensive and offensive chemical operations. The object of this training was to insure that every individual was proficient in the use of his defensive equipment and that all chemical units and the command elements of pertinent ground and air organizations were prepared to wage all-out offensive gas warfare.

The chemical warfare schools also trained selected officers of the Navy, Marine Corps and Coast Guard, as well as civilian instructors for the Office of Civilian Defense. During the 18 months following the attack on Pearl Harbor when enemy air raids on the continental United States were considered possible, if not probable, the Chemical Corps conducted seven War Department Civilian Protection Schools which qualified more than 10,000 men and women in home front incendiary and gas defense.

It should be emphasized that Chemical Corps units and personnel were so trained that they were capable of being continually employed in non-gas warfare. All types of chemical units except decontaminating companies operated either full-time or part-time in the performance of their primary mission.

Decontamination units, with their 400-gallon tank trucks, carried water to thirsty outposts, furnished showers for soldiers at the front, pumped out flooded dugouts and served as auxiliary fire fighting companies. The 400-gallon "decons" were constantly in demand everywhere and were one of the most popular pieces of equipment produced, although never used for the purpose for which they were designed. When more smoke units were needed for port screening, decontamination companies were diverted to smoke generator operations.

Processing companies not engaged in their primary mission operated chemical depots, performed maintenance, did dry cleaning for the Quartermaster, manufactured ice cream for the Red Cross and were employed in numerous other activities.

Laboratory companies, set up to analyze and identify chemical agents and munitions used by the enemy, also developed new camouflage paints and dyes and, in the Pacific, prepared greatly needed quinine tablets and converted antimustard bleach powder (hypochlorite) for the purification of water. One chemical laboratory company converted khaki uniforms into jungle suits for the Buna Campaign, tested tent-preserving compounds for the Quartermaster, prepared solutions for reproducing Engineer maps, and manufactured a rust-inhibiting solution, the lack of which threatened to ground planes in the Southwest Pacific in 1942. Frequently, the Chemical laboratory companies were the only science laboratories available, and all branches of the armed forces utilized their services.

Today, research, training and procurement planning are the principal concerns of the Chemical Corps and are the cornerstones of a peacetime program which is designed to keep the U.S. Armed Forces second to none in the application of chemistry in modern warfare. At the Army Chemical Center at Edgewood, Maryland, research goes forward in toxic agents, defensive equipment, incendiaries, screening smokes, the flame thrower and the chemical mortar. Its toxicological and medical laboratories work to devise improved medical protection against new toxic substances, as well as treatment of injuries due to chemical agents. New products from the chemical, mechanical and medical laboratories which appear to have possible military application are tested at Edgewood Proving Ground, Dugway Proving Ground, and at the jungle test station of the Chemical Corps. Tactical doctrine governing the employment of chemical weapons and munitions is under constant study and field testing to assure that the Armed Forces are at all times ready to cope with any possible development in the field of chemical warfare.

Not the least of the many products of wartime research and development are the peacetime applications which can now be made of materials of war. The highly improved smoke devices and the new mechanical smoke generator provide economical means of laying ground fogs to protect crops from frost. The smoke pot and smoke generator, as well as the airplane smoke tank, have been used to disperse insecticides where orchards, grain fields and row crops are imperiled. Flame throwers have been used to destroy water vegetation which impedes river navigation, and a modification of the weapon known as the flame cultivator has been manufactured as a new implement of the farmer in his war against weeds.

To overcome the short range of the standard police tear gas grenade used in riot control, the Chemical Corps has devised a plastic sphere the size of a baseball, to permit easier handling and to achieve greater throwing distance and accuracy. Gas masks, permeable and impermeable clothing, and cellophane capes developed for gas warfare can provide new safety for industrial workers handling hazardous chemical agents.

One of the gas protective compounds investigated by the medical laboratories as a defense against arsenical poisoning has proved extremely successful in the treatment of a variety of metallic poisonings. Another substance is being studied for its protective effects against cyanide poisoning, which like metallic poisoning is an occupational hazard in many industrial processes. Two new toxic compounds, once considered as potential war gases, are now being tested for possible use in the treatment of certain diseases. One, developed as a nerve gas, appears to have some value in the treatment of glaucoma, an eye disease. The other, the nitrogen mustard series, are being tried for certain types of cancer and may become useful research weapons in the hands of medical scientists.

NAVY

The Navy And The Atomic Bomb

*by Walmer Elton Strope**

Condensed from *U. S. Naval Institute Proceedings*

THE first of July dawned bright and clear. As thousands watched, the morning air over the lagoon of remote Bikini Atoll was made even brighter by the flash of the fourth atomic bomb, an important event in Operation Crossroads, most vital of scientific experiments in the history of the United States Navy. Those fortunate enough to witness this culmination of months of technical planning viewed the awesome spectacle of the unleashing of nature's most intimate and terrible power. Some of us there received a second, more subtle impression in the weeks that followed; for it soon became apparent that the flash of the Able Day bomb had rendered bright and clear much of the darkness and uncertainty which had shrouded the future of the United States Navy.

The future of the Navy is of primary interest not only to those of the naval profession but to every citizen of our country. The Navy has been traditionally America's "first line of defense" and for generations has been largely instrumental in protecting the Western Hemisphere from the destruction which accompanies modern war. It is entirely reasonable, therefore, that men should feel concern over that which has been their protection in the past and should seek to know what parts, if any, of this protection system are able to survive the changed conditions brought about by great advances in scientific and technical warfare.

This concern is well-founded. We stand today on the threshold of the atomic age. Atomic explosives and power, supersonic rockets, television, and radar threaten to bypass the conventional duties of the Navy. Command of the sea takes on a different aspect. The traditional naval role of carrying the fight to the enemy's shores encounters new problems. The advent of guided missiles means another new weapon which must be considered. Some people, then, are asking how we can justify the continued existence of the fleet?

All sane persons must favor a strong international control system for the prevention of atomic wars in the future. It is widely held that the terrible havoc of an atomic conflict might hurl present-day civilization hundreds of years into the past, if not eliminate it altogether. Such an end is certainly not to be contemplated by thinking men. Yet, despite this, we must face the possibility, or even probability, that the necessary controls will not be authorized. Nations jealous of their traditional sovereignty and governments which are wont to use force as a bargaining agent may combine to stall effectively the will of the people of the world.

It was from considerations of this kind that Operation Crossroads was deemed necessary in the eyes of those responsible for the Navy and the defense of the Nation. If defense plans must be based on the use of atomic weapons, one of the most immediate problems is the determination of the destructive power of these weapons in naval warfare.

It is true that some supposedly responsible persons claimed that the experiment was not necessary since the effect of the bomb on naval units could be calculated, using existing data. To competent naval designers it was obvious that these people had no conception of the problems involved. That they were wrong in their assertions that damage to naval vessels could be predicted was amply demonstrated by the results of Tests Able and Baker.

On the contrary, Operation Crossroads was most necessary. Many important facts of a technical nature regarding the effect of atomic detonations on naval vessels were learned at Bikini. All of these facts are, quite naturally, classified confidential or secret and are likely to remain so. However, the broad results as released to the public through press releases and the reports of the President's evaluation board were all that is necessary to reorient our thinking on the future of the Navy.

One of the most obvious conclusions which may be drawn from the extensive tests conducted at Bikini may be stated thus: *The atomic bomb is not at present, nor will it be for some time to come, a practical weapon for use against a fleet at sea.* One does not need special technical training to reach this conclusion and, indeed, it has been stated in public print many times since the

*Architect, Bureau of Ships, Navy Department.

tests at Bikini. The reasoning leading to this statement is fairly simple.

Fundamentally, the question of whether the atomic bomb is effective against a fleet at sea can be reduced to the question of whether the bomb is a "multiple target" weapon where the targets are naval vessels. In other words, if an atomic bomb is dropped in a task force disposition, can it be expected to sink more than one major vessel? If not, it can be shown that the task of destroying a fleet can be made so costly that either the cost is prohibitive or the bombs may be used to better advantage against other targets. Operation Crossroads demonstrated that the destructive power of the atomic bomb is much less at sea than it is over land. Nearly everyone is familiar with the tremendous damage done at Hiroshima and Nagasaki—all structures destroyed over an area of nearly three square miles. This has been regarded as the area of "total destruction." On the other hand, the Joint Chiefs of Staff Evaluation Board for the Atomic Bomb Tests reported that the radius of critical damage was something less than half a mile. This figure can be arrived at by other means. For instance, it has been announced that in both tests there were 40 vessels within a mile radius, and 20 within a half mile radius of the bomb detonation. There were but five ships sunk in the first test, and only 11 of all descriptions in the second test. Since those sunk were among those closest to the bomb detonation, it thus appears that the area of "total destruction" was less than that encompassed by a circle with a radius of a half mile. Such a circle has an area of 0.785 square mile, or only about one quarter of that reported in the destruction of the two Japanese cities.

There are several reasons for this phenomenon. Some, of course, may be purely physical reasons, a difference in the reaction of the atomic blast on solid and liquid surfaces. That possibility is no doubt being studied. One of the obvious limiting factors at sea, however, is the structure of the targets. Naval vessels are engineered structures specifically designed to resist not only the great strains imposed by storms at sea and the tremendous shock of their own gunfire, but also the pitiless blast of enemy torpedoes and bombs. They are war machines. It is only too obvious that laymen and non-naval scientists prior to Bikini grossly underestimated the innate resistance of our naval vessels to damage. Operation Crossroads proved that ships, even lowly transports, are immeasurably superior to any normal land structure in this respect.

Much of the damage at Hiroshima and Nagasaki was attributable to fires. Here, again, is a threat to which naval vessels by design are highly resistant. They are aided in this respect, of course, by the proximity of fire's greatest enemy, water. So it is not surprising that the radius of destruction within a task force is sharply reduced from that observed upon cities and other land installations.

We cannot lose sight of the fact that at Bikini each bomb sank several vessels (although only the second caused the loss of capital ships), and therefore was, in effect, a "multiple target" weapon. However, the target arrays were condensed into an extremely small area compared to that occupied by a normal task force disposition. Twenty vessels were jammed into a half mile radius during the tests, while a normal wartime cruising disposition often has vessels situated at 1000-yard intervals. It thus appears that under actual sea conditions even the cataclysmic upheaval of the atomic bomb can wreck only one or two vessels at the most.

In the above discussion we have not mentioned the most peculiar and most deadly of the effects of the atomic bomb; that which sets it apart from molecular explosives—radioactivity. Radioactivity is a phenomenon new to warfare, with many technical ramifications. It is not necessary to consider here these ramifications, the data on which has not been released. It suffices to consider the general effect of radioactivity as represented in reports both of Bikini and the bombed Japanese cities. In all these reports, it will be noticed that the area surrounding the detonation for several miles was rendered uninhabitable for a considerable period of time. In Japan, people within these poisoned areas sickened and died. On land, the radioactivity remained dangerous for several weeks, although limited stays in the affected areas could be made without harm. After Test Baker, the vessels anchored in the lagoon were drenched by radioactive rain thrown up by the blast. They steeped in this radioactive bath for several days before efforts could be made to decontaminate them, and it was found that they remained radioactive long after the water in the lagoon had become relatively safe. Inspection of some of the target vessels was held up for several weeks. It must be concluded, then, that one of the most important effects of the atomic bomb is that a large area surrounding the explosion is poisoned and made uninhabitable for a long time by radioactivity.

Land installations and non-mobile naval installations such as shipyards, anchorages, and so on would feel these effects most strongly. It may be quite possible to protect such installations from the blast and heat of atomic missiles by burrowing deep into the earth or constructing heavy concrete defenses similar to the German submarine pens of the recent war, but all this work is made useless by the radioactive particles released by the atomic bomb, which sift down through the minutest openings and make the protective shelter itself a radioactive "oven."

A fleet at sea, on the other hand, is not particularly vulnerable to the attack of radioactivity. All vessels not actually sunk or completely immobilized by the blast of the bomb can clear the radioactive area in a very few minutes, and it is almost certain that such action would result in largely neutralizing the threat of radioactivity. Thus we find that not only is the destructive power of the atomic bomb considerably reduced when a fleet at sea is the target, but the radioactivity engendered by the bomb is also made relatively ineffective by the mobility of the task force. This is the basis of the con-

tention that an attack with atomic missiles which would neutralize or destroy a city or military installation would be relatively ineffectual against a fleet at sea.

Few people realize what vast "resources of defense" are available to the Navy. Further, the fleet is almost completely uninhibited in the application of these defensive measures, no matter how radical, freely altering ship design, logistics, tactics, and even strategy to accomplish the desired end.

Consideration of the above facts has caused the atomic bomb to be labeled a failure in some quarters. The atomic bomb was not a "flop" at Bikini. One has only to view the motion pictures of one of the detonations to realize that an explosion of such violence and magnitude could hardly be called a failure.

For those who expected the atomic bomb to prove itself as a multiple target weapon the Bikini tests were indeed disappointing but the bomb's destructive power against a single vessel was not. It seems quite obvious from the information which has been released that no naval vessel existing today can survive a direct hit or very near miss from an atomic bomb of the type demonstrated at Bikini. As a matter of opinion, it is extremely doubtful whether any floating structure could be designed to survive a direct hit by an atomic bomb and still retain its ability to perform the functions of a naval vessel.

Conventional naval design is based upon the capital ship as the highest type of naval vessel, capable of absorbing a maximum amount of punishment and still remain a fighting ship. A capital ship is expected to absorb multiple hits from any weapon without sinking. Yet, it now appears that no vessel can survive even one hit from an atomic weapon. Hence, much of the protection now a part of capital ships may prove superfluous, and the devotion of weight to this protection uneconomical in the design. This weight might better be devoted to increasing the speed, the range, or the offensive power of the vessel. Too, smaller vessels may prove to be the best solution under the new conditions.

Another important lesson of Operation Crossroads was learned which will result in great changes in the Navy as we know it today. The tests at Bikini illustrate graphically what will happen to a fleet caught at anchor as the United States Pacific fleet was caught at Pearl Harbor. Not only would physical damage be widespread as the result of the relative crowding of the vessels in the anchorage, but radiation poisoning of the base would prevent effective control of the damage and delay salvage operations. The naval base itself, consisting of shipyards, drydocks, supply depots, ammunition depots, barracks, hospitals and so on, would be even more vulnerable as indicated by the destruction in Hiroshima and Nagasaki. Therefore, the navy of the atomic age must avoid at all costs the possibility of annihilation within its bases. In order to prevent such a disastrous eventuality, it will be necessary to maintain a large portion of the fleet at sea at all times to avoid the possibility of a surprise attack. This portion of the fleet, whether it be one-half, one-third or a smaller portion, must be able, independent of its bases, to carry out the required retaliative measures. Not only must the task forces at sea contain adequate offensive power to perform the Navy's defensive functions, but they must be able to steam the necessary distances and remain at sea the necessary time to accomplish their missions, even at the end of a protracted cruise, without the necessity of returning to their bases. These bases would undoubtedly be among the first targets of a surprise attack. These requirements indicate that the naval vessel of the future must have a great radius of action and extraordinary sea-keeping abilities. Rapid development and use of the most modern types of power plants, perhaps even atomic power itself, is indicated. What form the future naval vessel will take is quite impossible to state, but it is certain to be the principal occupation of a great many minds for some time to come.

For that matter, the development of atomic weapons will, no doubt, occupy as many minds. The atomic bomb in itself has received so much publicity that one is liable to overlook the fact that the incorporation of the atomic explosive in a gravity bomb was merely an expediency of war; merely the simplest method of accomplishing the immediate end. We may look forward to the employment of the atomic explosive in more versatile weapons, such as the rocket-propelled guided missile and, possibly, the torpedo and mine. Elaborate systems for homing these lethal missiles to their target will be developed. Against these threats, countermeasures will undoubtedly be sought to detect and immobilize or destroy the attacking weapon at a safe distance. Perhaps devices will be perfected to detect at great distances the existence of the atomic explosive itself.

All of these developments will affect ship design profoundly. Certain ship types may disappear and perhaps be replaced by new types. There is the possibility that surface vessels and submarines may be merged, creating a more versatile navy capable of operating either on or under the sea. Gunnery, as we know it, will be replaced by rocket-launchers and other devices which will increase the striking range of the Navy tremendously. All of which indicates that under the impact of the unrestricted use of new scientific discoveries, the character of the United States Navy will be changed at least as completely and rapidly as it was 75 years ago when the rifled gun, Krupp armor, and steam engineering banished the age of sail into the pages of history.

But another and more vital question remains unanswered. Is it not probable that the impact of the new scientific discoveries mentioned above might eliminate the Navy altogether rather than merely alter its character? There are many who believe so and cite in support of this contention, the present progress toward long-range rockets which some day might enable a belligerent nation to attack and destroy any spot on the globe, however far removed, and thus eliminate the need for an intermediate agency, such as a navy, to carry out de-

fensive and offensive measures against distant shores. Further, is it not possible that the future atomic war may be decided in so brief an interval of time that the traditional concept of "control of the sea" will lose most of its meaning? It is the thought of this brief and terrible "push-button war" which has struck terror in the hearts of peace-loving peoples and has created the widespread feeling of distrust in existing means of defense.

The atomic war of the future has been dubbed "push-button" warfare because of the variety of novel mechanisms which science has recently introduced into warfare. We envisage a type of warfare in which the human agencies are far removed and the actual attacks are accomplished by means of robot projectiles guided accurately from a remote point of origin and loaded with devastating atomic explosives. The industry, transportation, government and, indeed, the whole civilian populace would be the targets. No principality, large or small, would be immune to these globe-girdling atomic weapons. A single, swift, overwhelming attack might destroy immediately a great nation's will, and even ability, to resist.

Thus the "push-button war" appears to be independent of all the moral, material, and economic factors which traditionally have influenced war and peace. Push-button warfare is the ideal tool of tyranny and aggression. By its use, the possibility of maintaining the personal liberty of the individual seems hopeless. In the past, totalitarian demagogues have been held in check, or at least, strongly influenced by the realization (fortuitous for freedom) that the democratic world possesses the preponderance of natural resources, industrial development, and manpower in the world today. It takes no imagination at all to reach a conclusion as to who would push the button first when the opponents are democracy and totalitarianism.

We learned at Bikini that the Navy is the logical place to "strategically distribute" the weapons required to assure retaliation in event of attack, because even in its pre-atomic age condition it is the least vulnerable of all our defenses. This ability to retaliate in kind would thus replace the traditional economic and material factors as the restraining influence against aggression. If the existence of an adequate "atomic" Navy means that the aggressor who seeks to destroy our cities with atomic weapons may expect his own to be destroyed instead, it is quite possible that destruction will be withheld, with neither side caring to begin the use of atomic weapons, so that atomic warfare might conceivably be relegated to the limbo of stalemated weapons, along with poison gas and other "outlawed" weapons.

Certainly the great nations who have the necessary natural resources, who have the economic and material factors which influence war on their side, would be reluctant to involve themselves in the uncertainties of atomic warfare.

Our policy, then, in a world without an effective international control of atomic weapons, should be to "speak softly and carry a big stick." Our big stick is an atomic Navy, maintained as the greatest in the world.

The task will not be easy. The foundation is there: a victorious and efficient navy. Our Navy is familiar with great responsibilities, geared to vast undertakings and rich in the "know-how" of defense. Even in its present state, it is the least vulnerable of all our defenses to the atomic threat. Upon this foundation must be erected a new and invincible bulwark to the designs of an aggressor. We must remake the Navy to fit the atomic age, even as it was remade to fit the machine age.

Fortunately, the time in which to prepare our defenses is available. We are not threatened with atomic destruction tomorrow. Spokesmen for the armed forces have recently assured us that the perfection of the devices required for "push-button" warfare is still a decade or more in the future.

Of immediate importance is the planning of an efficient atomic Navy. Atomic weapons must be designed suitable to be carried at sea. Vessels must be planned to accommodate the new weapons. The technical lessons learned during Operation Crossroads must be applied to make the new fleet even less vulnerable to attack. Research facilities must be expanded. Much study is required in such fields as the response of ship structures to high impact loadings, the shock-mounting of vital equipment, and the reduction of fire hazards aboard fighting ships. Investigation of methods of protecting personnel from blast and lethal radiation will have to be undertaken. Energetic development of more efficient and less vulnerable means of propulsion is necessary. All of these projects are in addition to the more obvious programs of research and development of atomic weapons and countermeasures.

Even more important is the actual construction or conversion of naval vessels embodying the most advanced plans and ideas. Research, in itself, is almost meaningless unless it is transformed into a practical reality. Indeed, many types of research cannot be undertaken unless a building program is present to sustain and encourage them. Shipyard personnel must be trained in the techniques of construction and maintenance of the new equipment. Many novel features must be tested in service to determine whether they perform as anticipated. It is possible that completely new ship-types will be presented to the forces afloat for training of personnel and development of new tactics.

The building of an "atomic" navy will take time. It will also take money. It would be a signal disaster if the Congress permitted an "economy drive," however well-intentioned, to nullify the lessons learned at Bikini. Such action would sabotage this country's defenses at a most crucial moment.

The Congress, by and large, reflects the will of the people; and since this is so, efforts must be made to acquaint the people with the dangers of excessive reduction of the nation's defenses. Further, they must be apprised of the vital "rebuilding" of our defenses that has been necessitated by the new weapons of the atomic age.

MARINE CORPS

WE MUST LEARN TO STOP TANKS*

So far the Marines have not had to face much in the way of enemy tanks. However, future operations may be against a tank-wise enemy; therefore, according to this article reprinted from the *Marine Corps Gazette*, the Marine Corps must be ready to counter armored attacks with effective antitank weapons.

by Lieutenant Colonel Arthur J. Stuart

WE MARINES are inexperienced in antitank warfare. Unless we devote our attention to learning that which we haven't had the opportunity to learn by experience, it may cost us dearly the moment we engage a non-Japanese enemy. Some time between the final shot on Okinawa and the next D-Day of the future, we must learn how to stop hostile tanks.

This serious deficiency in our combat experience and fighting know-how has come about naturally enough. Our erstwhile Pacific enemy injected many new weapons and tactics into the fight; but tanks worthy of the name and armored tactics were not among them. Although tanks and armored warfare were recognized major factors in the military doctrine of all other nations, the Japanese could not, because of peculiar limitations of their national economy, manufacture and place in the field modern armored equipment in other than negligible quantities. Thus, more or less through inadvertence, we marines are probably the only contemporary military organization that has never had to face a strong tank attack. With so much else to worry about during the desperate Pacific fighting, marines quite properly gave the problem little, if any, thought. Without the impetus of necessity and with our attention absorbed in more pressing problems, we have let the antitank field lie generally dormant.

But the battles of the past have been won. And today we must prepare ourselves to fight . . . and to win . . . the battles of the future, under the conditions of the future! This sobering task demands that we search for our weaknesses (for what was not a weakness three years ago may be one today), honestly admit them to ourselves, and apply ourselves to achieve their deliberate elimination. We have much to do. And among that which is most pressing is the job of adapting our amphibious technique, and otherwise readying ourselves to fight an armor-strong enemy.

What is the nature and importance of the thing we must learn to protect ourselves against, the hostile tank attack? What is the likelihood of our having to face it? In order to evaluate the importance of the antitank field, let us, for a moment analyze the tank, for the two are inseparably connected.

The tank is today a triple-threat weapon. It is a powerful infantry support weapon; it is the dominant ground weapon of exploitation; and it is one of the most important of all antitank weapons.

The tank has become an invaluable infantry support weapon. It is a favorite of infantry, for it provides the closest of all supporting fires. It physically accompanies the infantryman, shares his experiences, sees what he sees, and helps him during the infantry assault, still the most grueling and dangerous feat of all warfare. The tank destroys or neutralizes the enemy's direct fire weapons, those weapons which pour aimed fire into the infantry. As tank-infantry communications and the technique of tank-infantry coordination were improved during the course of the last war, the power of the tank-infantry team increased several fold. In Europe, the last war closed with millions of infantry and thousands of infantry tanks moving on both sides. One U. S. Army infantry officer, in a recent analysis of infantry action in the European Theater, wrote that decisive infantry action seldom occurred except when tank-led! And it is today the well-established doctrine of all military powers to concentrate infantry tanks in great strength as a battering ram of steel to spearhead the infantry main effort. Thus tanks have become a normal and important part of decisive infantry action. Indica-

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tive of the importance of the infantry tank, our Army recently announced its new postwar infantry division (war strength) with 150 organic tanks!

Commencing with the lightning panzer operations in Poland at the outbreak of the recent war, the tank became the major ground weapon of exploitation. It continued in that role throughout the long European War until Allied armored drives from the East and West into the German homeland brought final victory. While current doctrine calls for infantry, assisted by infantry tanks, to effect a breakthrough, it also calls for commitment of armored units through the breach against deep objectives of major importance. Such armored exploitation operations are the logical follow-up of the breakthrough and have as their goal the expansion of the local victory into a sweeping victory of many fold importance. The U. S. Army's new armored division (war strength) with 340-odd organic tanks, reflects the current importance of the tank as a weapon of exploitation.

By the close of the last war the tank had been assigned a third important role. It had excelled and replaced the tank destroyer as the standard heavy, armored, self-propelled antitank weapon. The tank destroyer evolved as a type when tanks were still armed with relatively light guns. The heavily gunned, lightly armored, faster tank destroyer was in concept designed to destroy tanks by seeking and maintaining optimum long ranges beyond effective range of tank guns. But as tank development produced heavier tanks with ever more powerful guns, the point was reached well before the close of the last war where tanks could effectively engage tank destroyers at ranges up to the maximum limits of visibility. This spelled the doom of the tank destroyer, for it had lost its basic advantage over the tank and had lost its ability to execute its basic tactical role. Thereafter the tank destroyer engaged tanks at a great disadvantage and the tank became the logical successor to its role. When it did so, it became a major antitank weapon, for of the whole family of direct fire antitank weapons, the heavy antitank gun accounted for more tank casualties than did all other types combined during the last war. Statistical analysis of tank casualties of the European Theater further shows that the self-propelled antitank gun was several times more effective than towed guns, and that armored antitank guns were far more effective than unarmored.

Such was the importance attained by the tank in its three major roles by the end of the last war. Postwar tank design continues to achieve rapid progress in increased gun power and fire control, greater mobility, and better armor protection. In addition to such inherent improvements in the tank itself, broader developments of warfare indicate a future role of increasing importance. Common sense and published data on atomic explosives indicate that fully armored vehicles have characteristics which tend to reduce the effects of concussion, flash-flame, and radiations—the principal characteristics of atomic explosives. Further, it is felt by many that full-scale atomic war would place greatly increased strategic and tactical emphasis on mobility.

VT fuzes, when perfected for general employment by artillery, mortars, and other weapons, will tend to radically reduce the protection afforded by the familiar foxhole and trench, but will have little effect on the fully armored vehicle except perhaps to afford it a curtain of close-in protection. One must ponder this for some time for its significance to be fully felt. Armor may well increasingly provide much of the protection hitherto taken for granted in the ground.

The foregoing current trends but add to the tank's already prominent position. We have seen the increased emphasis on armor reflected in the U. S. Army's postwar infantry and armored divisions. The trend is the same in foreign armies. Let us consider, briefly, the Red Army, for it is today probably the most experienced military organization in the world in both tank and antitank warfare. The Red Army has placed ever-increasing emphasis on the tank arm. Its major infantry breakthrough operations of the recent war were led by concentrations of thousands of infantry tanks. The breakthroughs were exploited by armored units as large as tank armies. The Red Army early developed heavy tanks and by the war's close had a ratio of one heavy to five mediums in action. Current Soviet doctrine supports a considerably higher ratio of heavies to mediums.

Thus, as a fact today, we face a military world strong in armor. If the other fellow has that with which he can hurt us badly, then, it has always been the Marine way to learn his game and beat him at it. The other fellow has tanks and we have got to learn how to stop them.

For, as the tank has gained, and continues to gain, importance, the antitank field likewise gains correspondingly in importance. Whereas we have had limited experience in the employment of tanks, we have had virtually no experience in antitank warfare. The Red Army, so experienced in antitank combat, has come to attach so much importance to it that Red Army Field Regulations state "The defense is primarily antitank defense!" In other words, the Soviets' opinion seems to be that to stop the tanks invariably leading the hostile infantry main effort is a major step toward stopping the hostile infantry and *preventing a breakthrough,* and should a breakthrough come, then, to stop the hostile tanks is the first step toward *containing it* and minimizing hostile gains.

But the antitank field is of broader importance than simply as a part of the defense. It is, in attacking an enemy strong in tanks, a necessary requisite of successful offensive operations. The tank arm is the fibre of the mobile defense, so much more difficult to overcome than the purely static defense. The coordinated powerful counterattack by hostile mobile reserves spearheaded by tanks constitutes perhaps the greatest single threat to the success of the normal attack.

Our airborne leaders have repeatedly stated that one of the greatest problems of airborne warfare is that of

how to stop hostile armor; they have consistently emphasized that an airborne force without an effective antitank defense cannot survive.

There are many similarities between airborne operations and amphibious operations and it is equally important that an amphibious force have an effective antitank defense. The problems and difficulties of achieving a strong antitank defense for an amphibious force during the crucial early phases of a landing appear to be almost as great as during the early phases of establishment of an airhead. The same difficulties of coordination, the same dearth of heavy equipment, and the same vulnerability of the rear with its vital landing areas, exist in both cases.

What is the nature, then, of this new field which we must learn? First, it is difficult. There is no easy way to gain antitank protection; it simply cannot be had cheaply. It constitutes a field of specialized employment of all the arms. Beyond this, all arms must be coordinated in their special role, and the execution or conduct of an effective antitank defense poses one of the most difficult of all problems of control and coordination. A little too late is much too late; to do nothing plays into the enemy's hands. And what must be done must be done under heavy fire. A careful study of the antitank lessons of the last war shows that courage and intuition are not enough—and that skill, precise control and coordination, and adequate equipment are required as well.

We have got to study the thing we must learn to stop, the strong coordinated tank attack. It is an attack inherently characterized by suddenness, surprise, and great power. Tanks can be concentrated relatively quickly for the tank attack or tank counterattack. They will be concentrated at the point of the enemy's selection. The attack will come on a relatively narrow front and its decisive phases will be of relatively short duration. It will often be preceded by artillery and aerial bombardment. The hostile tanks will be followed by infantry, covered by infantry, and assisted by infantry weapons. They will be assisted by direct support artillery and aviation. Tanks themselves will concentrate their tremendous fire power on our forces at the point of contact, which the enemy will have made every effort to determine in advance, as well as the exact nature and disposition of our local forces.

The tank attack, whether it be the case of a tank company or battalion spearheading an infantry drive or the thrust of a large armored unit, thus constitutes an unusually great concentration of fire power and fighting power in a local sector designed to overcome all resistance in that sector. It seeks to achieve decisive results before other more distant weapons can react while local defending weapons fight greatly outmatched on terms of extreme fire inferiority. The enemy will make every effort to isolate the local area of attack by employing covering fires of all types. He will attempt to literally smother our local defending forces, to neutralize them to be virtually incapable of resistance, and finally to overrun and destroy them. That is essentially the nature of the thing we must learn to protect ourselves against.

What is the nature of the antitank defense we must develop to stop this type of attack? Let us start with a fundamental common sense approach to the problem.

We need first to learn all we can about tanks and tank tactics, if for no other reason than to be thoroughly familiar with this problem of stopping the enemy's tanks. We need this knowledge to evolve a sound antitank doctrine and have confidence in it.

Then over and above all matters of technique, the nature of our antitank defense must in essence provide a strong counterconcentration of tank stopping power at the point of the hostile tank attack.

The most favorable conditions possible must be created through maximum employment of passive antitank measures. In the defense, maximum use must be made of antitank mine fields and both natural and artificial antitank obstacles of all types to slow, weaken and canalize hostile tanks. We must do the same thing in the attack. We must improve on the Russian technique of throwing out a screen of controlled mines to protect intermediate objectives within a matter of minutes after seizure in anticipation of the inevitable tank-led German counterattack. We must learn to employ all types of passive antitank measures to gain time and develop favorable conditions for employment of our active antitank weapons.

While passive defensive measures are important, we must not place undue reliance upon such measures alone. Passive antitank defenses are generally capable of being breached, bridged, or by-passed. Tankdozers, bridge-laying tanks, and other more elaborate equipment have been developed for that very purpose. Passive defenses but assist the functioning of the active antitank defense.

In active antitank defense, each arm must develop streamlined timesaving techniques specifically designed to be most effective against the hostile tank attack. Necessary speed and precision can only be achieved through the evolution of a definite doctrine or role for every arm in antitank defense and through careful prior training in that role to achieve near-automatic performance.

Let us consider first the antitank problem of the infantry arm. Infantry depends, in the final analysis, on other arms for over-all antitank protection very much as it depends on other arms to provide counterbattery fire. It is the least suited of all arms to fight tanks, for the tank was specifically developed and designed to destroy infantry. The tank gun is far more powerful than the heaviest infantry gun. Tanks can concentrate fighting power to a far greater degree than permitted infantry because of its dispersion limitations. And finally, the nature of combat is unfavorable to infantry as hostile tanks will concentrate at the point of their selection to attack only a local sector of infantry, which must defend all sectors. Infantry is thus typically dispersed in relatively thin dispositions; and infantry's

ability to react, to move, or to move its fire—in short to counterconcentrate—is relatively limited. Such antitank weapons as infantry possess—bazookas, recoilless types, etc., have severe limitations. Although they are tank killers on the proving ground, they have three weaknesses: they are manned by exposed personnel; they are direct fire and so can be observed and their fire returned; and finally, in the normal infantry defense there aren't enough of them at any one place and they have such limited battlefield mobility that they can seldom be moved to oppose a tank attack after its commencement.

Perhaps the most serious weakness, that of exposed personnel, requires that unprotected antitank gunners must function in the face of, and at the time of, the extremely heavy fires of attacking hostile tanks and their supporting fires, if they are going to function at all! Regardless of courage or spirit, the flesh can't stand. We saw that eloquently proven in the Pacific by the failure of fanatical Japanese suicidal tank-hunting teams. It is a lesson, proven in the Pacific and upheld by the record in Europe.

All such short-range direct fire weapons are by their nature subject to being seen themselves by the hostile tanks when they open fire, if not before. From then on out it is a close-range direct fire duel with tremendous fire superiority and every other advantage on the side of the attacking tanks. This situation is but aggravated by the fact that such infantry weapons as happen to be in the zone of hostile attack are relatively few and those outside the immediate zone are characteristically rendered incapable of assistance. In summary, the infantry antitank weapon is one of emergency self-protection. Its proper role is to provide local protection against remnants of hostile armor surviving the fires of heavier antitank weapons. That is the theoretical and practical extent of its capabilities. Barring revolutionary new developments, it will probably be the extent of its capabilities in the future.

The role of artillery in antitank defense is potentially an important one indeed. The Russians achieved considerable success of artillery in direct fire barrages followed by the employment of artillery in direct fire as a final phase. The field gun, as an indirect fire weapon, has great inherent antitank value for the hostile tank can be struck by it but the hostile tank cannot strike back; it cannot turn its massed fire power on it as it can on the direct fire infantry antitank weapons. Although artillery has this tremendous advantage over tanks by virtue of its indirect fire, it has a serious limitation. Indirect fire inherently lacks point accuracy and a direct hit by medium or heavy caliber artillery is required to seriously damage or destroy a modern tank. This does not mean that artillery is unimportant in antitank warfare. Quite the contrary. But it does require that it be massed to deliver concentrations of unprecedented density. We must perfect our techniques of massing fires, for the higher the density of fire the more effective the barrage will be. Antitank barrages must be carefully pre-planned for the timing and placement of such barrages pose many problems. Broadly speaking, every gun within range must be concentrated on the hostile tank approach or we but play into the enemy's hands in allowing him to accomplish our piecemeal destruction. This type of artillery employment, with its critical time factors, calls for the development of the most precise control of massed fires. It calls for the pre-planning and the automatic execution of an artillery antitank doctrine which we must develop in detail.

Like artillery, our own tanks to function effectively as antitank weapons require maximum time factors achieved by the antitank warning system. They must employ mobile tactics to move in strength from central dispositions out to any threatened sector prior to the enemy's arrival. They must take up previously reconnoitered firing positions, providing maximum ground and aerial concealment, hull defilade, and good fields of fire, preferably providing fire at the flank of the hostile armor. They must utilize their mobility to move from position to position. Our tanks must be flexibly employed in strength, for here again, a little is not enough. We must devise a doctrine for control of our tanks in antitank defense at division, corps, or the very highest workable level, in order that we can counterconcentrate sufficient strength to meet and destroy the hostile tank concentration. Decentralized control clearly plays into the enemy's hands by permitting our piecemeal destruction. Thus, if the enemy concentrates his tanks to attack one unit of a corps, all tanks of the corps must, if needed and physically capable of the movement, be employed to repel the attack, rather than have the tanks of units not attacked stand idly by only to see the enemy overrun neighboring sectors, outflanking their own positions, and later find themselves attacked from the flank or rear or forced to withdraw under most unfavorable conditions.

Because the same Marine tanks that must provide antitank protection are, broadly speaking, also employed to support our infantry, we must develop a positive system of dual tank control. Such a system of control must be flexible to provide maximum antitank protection interference with the important infantry support mission. A "graduated system of antitank alerts" is a possible solution. Such a system might well include an "alert" calling for the automatic antitank employment of tank reserves under direct control of the division or corps tank officer, another "alert" to automatically provide coordinated employment of the tank reserve plus the tanks in support of the threatened infantry regiment's sector, and an "alert" calling for the automatic coordinated employment of all tanks. The record proves the great value of direct artillery and air support to tanks in tank versus tank action. Tank-borne artillery forward observers and forward tactical air controllers, with direct communications, appear to be a "must" for our tanks in the antitank role.

Naval gunfire is the Marine Corps' artillery during

the critical period to the landing of our field artillery. Although it is highly effective in an antitank role in delivery of direct fire, it is of very limited effectiveness in delivery of indirect fire. This is not good enough, for a smart enemy will give our naval gunfire support ships only fleeting glimpses of his tanks. We must make naval gunfire also an effective indirect fire antitank instrument. Called naval gunfire support must be initiated earlier during the beach assault; if necessary, with NGF spotter personnel embarked in tanks or other armored communication-observation vehicles. Techniques must be perfected to provide direct naval gunfire support to our tanks in their antitank role, at least until artillery becomes operative ashore. This may involve the initiation of tank-borne gunfire spotter personnel and direct tank-ship communications. Beyond this, in indirect fire the antitank value of naval gunfire, like artillery and tanks, will vary directly as its over-all flexibility and ability to mass are increased. We must strive to shorten existing time factors required to mass the fires of our fire support ships.

Aviation has been proven to be a valuable antitank arm. Aviation is of vast indirect importance in strategic bombing, invaluable in striking hostile tanks in assembly areas, in defiles, and in striking supply trains of armored units. It can slow or stop the over-road movement of armor. Its observation function is vital. But to date, aviation has been of far greater value in thus striking tanks prior to inception of the tank attack than it has been as a tactical antitank weapon once the hostile attack is launched. This has been due to the fact that we have lacked an aerial weapon, heavy enough to knock out a tank, that has either sufficient point accuracy or sufficient density of area fire to hit moving deployed tanks. Development of a homing bomb of a type rendering countermeasures difficult is needed; or a rocket of greatly increased accuracy may become the long-sought effective aerial antitank weapon. In addition, we must streamline our present close air support technique to increase aviation's effectiveness as a tactical antitank weapon. Existing time factors required to obtain a close air support strike simply won't do—the hostile tank attack would be over! Like naval gunfire, we must achieve continuous called close air support throughout the landing, commencing at H-hour, if necessary by employment of armored communication-observation vehicles to carry our forward tactical air controllers. And, as a proven factor of great value, we have to perfect direct air support of our own tanks in their tank destroyer role. This will probably require tank-borne forward tactical air controllers and direct tank-plane communications.

Centralized control, to provide flexibility and the ability to mass constitutes the all-important characteristic of the special antitank functions of the several arms. Its workability depends directly upon adequate warning time. Therefore, we must bend every effort to achieve an effective antitank warning system. Marine intelligence must become tank-minded; we must develop and utilize every means of ground and aerial observation, including radar observation; we may find it necessary, as the Red Army has, to set up special antitank communication nets. Whatever is necessary must be done for we will never have a good antitank defense without a good antitank warning system!

In all the history of antitank warfare the error most consistently and frequently recurrent is failure to bridge the gap between proving ground or theoretical capabilities of weapons and their actual capabilities *in the face of and under the conditions of the hostile tank attack.* There is only a relatively brief period during the course of the hostile armored attack during which the Marine antitank defense will either succeed or fail. It must be able to function under the difficult conditions existent at that time. The enemy will seek at least temporary air and artillery superiority to support his coordinated tank attack. He will lay down intense direct fire from his tanks and infantry weapons in the actual zone of attack. He will seek to drive our aviation and aerial observation from the air; he will seek to neutralize our artillery by counterbattery and air attack. He will seek to blind our observation and disrupt our communications. We must recognize these things and overcome them. The antitank functioning of the several arms must in this sense be shockproof. It must have staying power. This is a big order and may involve duplicating observation and communications; it may require large-scale smoking operations to cover our tank movements, artillery gun positions, etc.; and it certainly will involve the most skillful utilization of protective terrain features in the location of command posts, communication centers, etc. The problem is to prevent a breakdown in the antitank functioning of the several arms during the very period that it is so vital that they function, to adapt them to specifically function under those adverse conditions. We must eliminate the frequent and often fatal miscalculation of the past between the theoretical and the practical. The necessity of keeping this important factor ever in mind in antitank warfare cannot be overemphasized.

But our problem goes beyond the development of special antitank functions and techniques for the several arms and the proofing of the several arms to execute those functions under the conditions that they must fight. We must achieve the coordination of the antitank roles of all arms. Thus the antitank roles of tanks, infantry, aviation, artillery, and the passive antitank functions of engineers must be carefully coordinated into one integrated defensive system. It is obvious that the interrelationship of the detailed functions of the several arms will vary in the attack, in the defense, by day and by night. It will vary in every particular situation dependent upon terrain, the enemy situation, and our own situation. The coordination of the antitank defense must, in the interest of flexibility, be a function of the highest workable echelon. Our higher commanders, and their staffs, must therefore be-

come expert in the antitank employment of the several arms.

Coordination in planning will require expert judgment. Coordination in the execution phase will prove a major task of command because of the two criteria to success of all antitank effort—*mass and speed!*

There is one thing more that must be added to the scope of our already gigantic task. We must adapt all this to the Marine specialties. We must adapt the special antitank functions of the several arms, their proofing to remain operative under contingent unfavorable conditions, and their coordination—to base defense and the amphibious attack.

The field of base defense poses many special problems, foremost of which is the extreme importance of proofing our antitank defense to function effectively under conditions of violent attack.

The adaptation of a strong antitank defense to all phases of our amphibious attack poses even more difficult problems. Yet, in the armor-strong military world today, it is vital that we achieve continuous positive antitank protection for all phases of the amphibious attack, commencing with the ship-to-shore movement and first assault echelons ashore.

Our troops still move ashore in landing craft or vehicles providing concentrated lucrative targets, and they are yet able to develop only a fraction of their fighting power while so exposed. Our protective measures, the LVT(A) and air and naval gunfire scheduled post H-hour isolation fires to protect this inherently vulnerable phase of the amphibious attack were specifically developed to be effective against a Japanese infantry defense. They were most effective against such a defense. But will they, without extensive modification, be equally effective against an armored defense?

Our amphibious attack was not designed to overcome such a defense and the characteristics of the LVT(A), the density of our NGF isolation fires and relatively cumbersome and slow procedures for massing naval gunfire, the relative lateness of landing our artillery, tanks, and heavy weapons, the relative lateness of initiation of called air and NGF support ashore —all these things reflect their background of development to cope with a hostile infantry defense. As we prepare ourselves to fight an armor-strong enemy, as we must today, it is necessary that we thoroughly scrutinize, and modify as necessary, our amphibious doctrine and technique.

To adequately protect our landing forces against the threat of hostile tank attack we must achieve a continuous antitank defense commencing with H-hour. And the nature of the threat precludes decentralization and dictates maximum centralization of control to achieve requisite massed protective fires of maximum speed and flexibility. Decentralization, always so tempting in landing operations, is the antithesis of efficiency in antitank defense. The nature of the coordinated tank attack renders it simply a case of united we stand, divided we fall.

That we are singularly lacking in experience in the antitank field and have relatively little knowledge of it, is a factual condition. While this has not constituted a weakness in the past, if it continues, it may constitute a grave fault in the future.

We saw the enemy fall helpless before the guns and flame of our tanks. We know the tank is inherently designed to strike without being struck. It is a weapon which very definitely requires a defense against it, with the cost of failure annihilation. Against the Japanese we had a virtual monopoly of these powerful weapons. That is no longer the case.

In conclusion, we must above all guard against complacency nurtured by our consistent successes of the Pacific War, for it is historically fatal for a victorious military organization to adopt the frame of mind or psychology that it has learned enough in winning any particular war to win the next one. We must, rather, always realize that we do not know enough, now, to win again! We have much to learn, including how to stop tanks.

RIDING AND SCHOOLING HORSES

By The Late Brigadier General Harry D. Chamberlin

The Principles of Equitation are laid down in this book in language understandable by everyone. It is a book written to help the reader become a better horseman. There are chapters on Seat, Hands, Application of the Aids, Saddlery, Schooling, and Jumping. This famous book, which has been out of print for some time, has been republished by the Armored Cavalry Journal. The price of the book is $4.00 a copy. Place your order now.

TANKS AND INFANTRY IN NIGHT ATTACKS*

*by Lieutenant Colonel W. D. Duncan***

NIGHT attacks have been employed by military leaders for centuries, but they have never been used as frequently as daylight attacks. Prior to World War II the use of stealth in night attacks was stressed. Stealth gave way to speed, fire power, and aggressiveness in many night attacks in the recent war. A great number of successful attacks were launched in which the artillery fired a concentration, and tanks with mounted infantry advanced rapidly, all guns firing. This type of night attack is the antithesis of that in which the infantry attacks silently, without an artillery preparation, and dispatches the enemy with the bayonet.

A soldier untrained in night warfare has an inherent fear of darkness and of the unknown which results in a great lack of confidence. He thinks darkness is his enemy. Training in night combat or participation in several successful night attacks will aid the soldier in overcoming a great deal of his fear, and will cause him to realize that the darkness is a silent friend, ready to help him.

When the average American soldier has been properly trained in both daylight and night operations, he will prefer to attack over open, flat terrain under the concealment of darkness rather than in the light of day. Well planned and well executed night attacks reduce casualties, surprise the enemy, maintain the impetus of the attack gained during daylight, and raise the morale of the attacking troops while lowering the will to resist of the defending forces.

During the latter part of the North African Campaign, the British adopted night attacks as the normal method of attack. In moving from El Alamein to Tunis, every major British assault was launched at night. As the war continued, the night attack became more and more common with United States divisions. In Italy and France the 3d U.S. Infantry Division adopted the night attack as a standard procedure and became very skilled in its execution. They concluded that, except for the degree of control needed, the procedure of planning and executing a night attack was essentially the same as in a daylight attack.

In Holland and Germany the 140th U.S. Infantry Division launched over one hundred night attacks, all of which were reported by the division as being successful. These excellent results were achieved because the division commander believed in night attacks and had stressed them in the training of his division before it entered combat. The 30th U.S. Infantry Division had similar success with night attacks in France, Belgium, Holland and Germany.

Nor was the enemy without success in night attacks. The Germans, confronted with allied power and artillery superiority, chose the night attack as a means of attempting the regain the initiative. In the Pacific, the clever night penetrations and infiltrations by the Japanese in the early years of World War II were responsible for many of their initial successes. Later, the night attack was used by the Americans in the Pacific to seize strong positions when the Japanese withdrew their main forces at night to avoid artillery fire.

Night attacks were found to be very successful when the infantry was supported by tanks. The approach of infantry and tanks in the concealment of night caused terror and a feeling of helplessness among many soldiers. This was especially true when the tanks and infantry advanced rapidly at night using assault fire. This method of attack was often used in the capture of small villages which were used as strong points by small, determined enemy forces. The attack usually began with a heavy artillery concentration which included rounds of white phosphorus to set the village on fire and to mark the objective. Then the assault units advanced rapidly, the infantry mounted on the tanks.

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**Instructor, Command and General Staff College.

The tanks fired machine guns and cannon as they advanced toward the burning objective. However, one must realize that tanks can be used successfully in this method of attack over suitable terrain only, and when the tank commander can see at least fifty yards to his front. There must be close cooperation with the infantry.

In the future, we may expect night attacks to be as commonplace as daylight attacks. Therefore, in order to insure an improvement in our methods and in the techniques of night combat, we must emphasize night operations in our future training programs. It is desirable that, at the outbreak of any future conflict, we have officers thoroughly trained and indoctrinated in night combat.

To become experts in night warfare, troops must train many hours under blackout conditions and must participate in all possible types of night operations. Tanks, infantry, and artillery must train together, each with a desire to develop the most efficient means of cooperation and coordination in night attacks and in night defense. The absence of night training will force units to experiment during combat, often at a great price, in an effort to achieve a measure of success.

An excellent example of what can be accomplished in night attacks by units which have fought together for nearly a year was demonstrated by the 30th U.S. Infantry Division and two attached units, the 743d Tank Battalion and the 823d Tank Destroyer Battalion, during the nights of February 25-26 and 26-27, 1945. During these two nights the division attacked along a 6,700-yard front with two regiments abreast, penetrated 9,800 yards into enemy territory, and captured eight villages defended by German *panzer* troops. The attacks took place over flat farmland consisting essentially of beet and stubble fields which were illuminated by a very dim moon. The attack moved parallel to and slightly in rear of, the enemy main battle position, exploiting a penetration made by the division between Jülich and Duren on the night of February 23.

On the night February 24-25 the enemy defenses along the Roer River were reinforced by the 9th and 11th *Panzer* Divisions. Elements of these divisions occupied the towns in the division zone of advance.

The 30th Infantry Division caught elements of the *panzer* divisions in the villages before they were able to orient themselves in the fast changing situation. The 30th Division moved rapidly during daylight February 25, into the villages of Rodingen and Hollen and occupied Steinstrass by 4 p.m. See Figure 1.

At this time it was decided that the best way for the division to gain its objectives, and to prevent the enemy armor from making a coordinated counterattack, was to continue the attack as soon as possible. However, attacking the villages over the open terrain in daylight would have been costly. Consequently, the division began a series of night attacks which completely broke the enemy resistance along the entire XIX Corps front, thus materially aiding the advance of the 29th Infantry Division and opening the door for the 2d Armored Division to race out over the Cologne Plain toward Düsseldorf and the Ruhr.

General Plan of the Attacks

The general plan for the night attacks called for continual assault throughout the night by the division. The regiments were expected to assault and capture one objective between the end of twilight and midnight, and another objective between midnight and dawn. Normally at least three infantry battalions with attached tanks and tank destroyers were attacking during the night in the division zone of advance. In some cases the same infantry battalion took one objective before midnight and passed on to take the second before daylight, while in other cases, one infantry battalion took a village before midnight and a second infantry battalion with its tanks passed through to take the second objective between midnight and dawn. See Figure 1.

During these night assaults by the 117th and the 120th Infantry Regiments, they were reinforced by the following armored units:

117th Infantry Regiment:
Attached:
743d Tank Bn.
Co C, 823d TD Bn.

120th Infantry Regiment:
Attached:
744th Tank Bn (L).
Co B, 823d TD Bn.

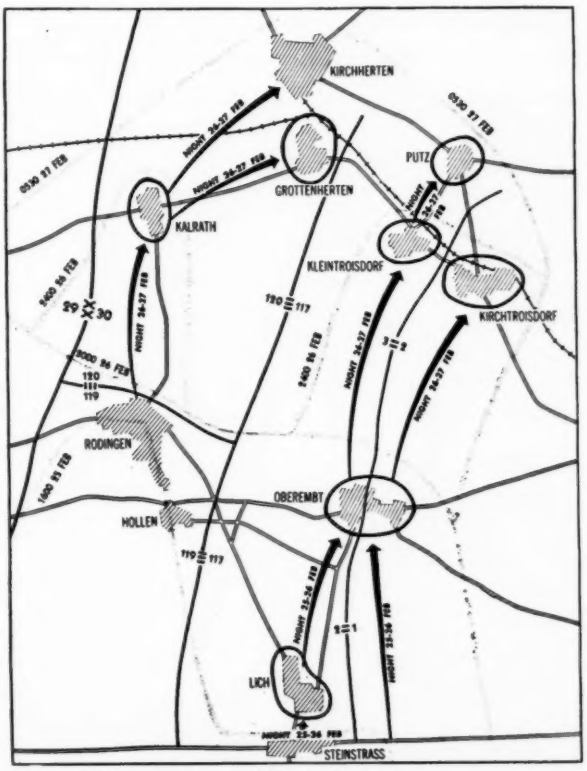


Figure 1

Details of the Night Attacks

The details of two of the four night attacks made by the 117th Infantry Regiment during the nights Feb. 25-26 and 26-27, illustrate one method by which tanks and infantry can attack successfully together at night.

During the night, February 25-26, Lich and Oberembt were captured. Warning orders for the attack on these villages had been issued immediately after the capture of Steinstrass by the 3d Battalion and the attack order was issued at 6 p.m., February 25. See Figure 2.

a. Attack on Lich.—A heavy artillery concentration was placed on the village at 9:45 p.m. (H hour). An assault company of the 2d Battalion, 117th Infantry, mounted upon the tanks of Company A, 743d Tank Battalion, advanced rapidly due north from Steinstrass. A second company of infantry followed in column on foot. The remainder of the battalion furnished fire support from Steinstrass. When the assault elements, moving forward at about five miles per hour, arrived within 100 yards of the village, the infantry dismounted and the tanks began to pour cannon and machine-gun fire into the objective. Then the assault elements moved into the village. By midnight the attacking elements of the battalion had cleared the town of enemy, had organized the pre-planned defense, and had repelled an enemy tank and infantry counterattack.

b. Attack on Oberembt.—The regimental order stated that upon the capture of Lich the 117th Infantry Regiment would prepare to continue the attack at 4 a.m., February 26, to seize Oberembt prior to daylight, 7 a.m. See Figure 1.

Formations for the Attack: 1st and 2d Battalions abreast, 1st Battalion on the right. The assault force consisting of two infantry companies attacked abreast, the assault platoons of each mounted on a platoon of tanks advancing abreast. Remainder of assault companies advancing on foot in column.

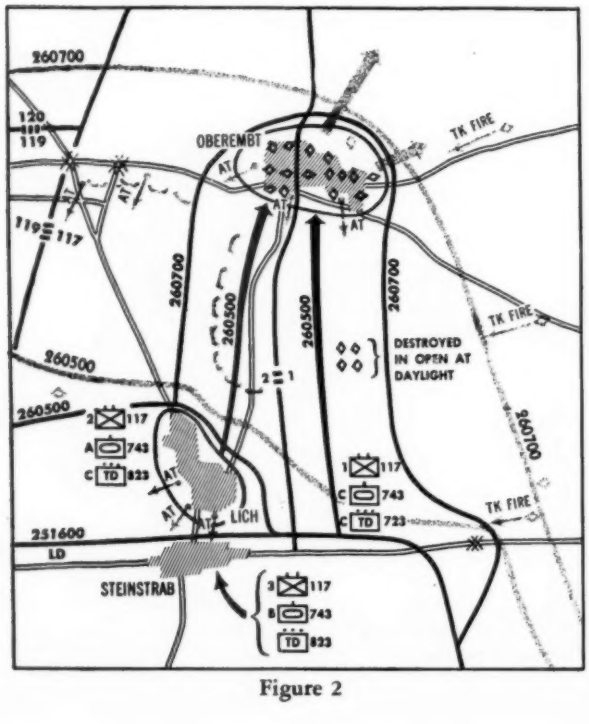


Figure 2

The 2d Battalion used the same formation as that used in the attack on Lich with different infantry mounted on the assaulting tanks.

A section of TDs and the tank company commander moved with the assault company on the right flank.

The reserve force consisted of the 3d Battalion minus.

Artillery and Supporting Fires: 2400-0400: Intermittent fire by infantry and tank mortars, tank assault guns, and by the 118th Field Artillery Battalion in direct support of the regiment; 0400: "Time on Target" by division artillery with occasional rounds of white phosphorus to mark the objective; "On Call"—heavy concentration to be placed on the objective or lifted on call of assaulting forces; a box concentration available to box the objective in case of enemy counterattack.

Control and Communications: Since the assaulting infantry platoons rode on the tanks to within 100 yards of the village, the initial control of the assault elements was simple. The tanks were guided to the objective by the burning buildings in it, and by the main roads leading from the line of departure. With this arrangement the infantry soldier, once mounted on the tank, could not become lost in the darkness, and the infantry following on foot could easily guide upon the tank tracks in the soft fields and upon the burning objective.

The infantry assault platoon leader rode in the platoon command tank with the tank platoon commander. They could discuss the situation as they advanced, and by infantry radio or tank radio could speak to all the other platoon leaders, to each tank in the platoon or company, to the tank company commander, and to the infantry company commander. With such a communication system available to each assault platoon leader it was almost impossible to lose contact between units.

The control of the units in night fighting was also safeguarded by detailed pre-planning. Excellent aerial photos, aerial mosaics, and 1:25,000 scale maps were available to all commanders down to and including the infantry and tank platoon leaders. Infantry platoon leaders and tank platoon leaders had carefully studied their routes of advance and had prepared the plans by which they would clear the enemy from the parts of the village assigned to them. They also studied and selected the defensive positions to be occupied on the perimeter of the village after its capture.

Conduct of the Attack: The 1st Battalion moved east at 2 a.m. from Steinstrass to deploy along the highway which was to be the line of departure. While this movement was under way, a German tank and several armored personnel carriers, with German infantry concealed by the darkness, made a surprise attack on the 1st Battalion. The surprise resulted in a scattering into the darkness of the leading companies. Then a tank

destroyer in a defensive position on the outskirts of Steinstrass destroyed one of the attacking personnel carriers with a direct hit, and the enemy force withdrew to the east. The confusion resulting from the surprise attack delayed the jump-off until 5 a.m.

At H-30 a tank platoon and two platoons of infantry moved along the highway to a position one mile east of Steinstrass and organized two roadblocks. While moving into position, this force encountered the enemy unit which had attacked the 1st Battalion just previously. After a brief encounter the enemy withdrew. Simultaneously with the jump-off, another enemy force, consisting of several enemy tanks and infantry, tried to drive through the roadblocks. Under the combined fire of the two infantry platoons and the tank platoon, the enemy withdrew hastily, leaving a burning tank behind.

Because of this protection on the east flank, the 1st and 2d Battalions crossed the line of departure at the new H hour of 5 a.m., with all leading tanks carrying infantry and firing their tank cannons into the burning objective. The objective was well marked during the assault by occasional rounds of white phosphorus falling on it. The assault units of the 1st Battalion advanced rapidly over the flat, open ground in the dim moonlight with only an occasional round from an enemy direct fire weapon attempting to locate them. The assault elements of the 2d Battalion encountered dug-in enemy shortly after leaving Lich, but the resistance was soon overcome when the infantry and tanks employed assault fire.

The assault units were within 1,500 yards of Oberembt before the leading tanks began firing their coaxial and bow machine guns. As the assault platoons arrived at a position 500 yards from the objective they requested the artillery to place a heavy concentration on the village and to continue it until the troops were within 100 yards of Oberembt. When the artillery lifted, the infantry dismounted from the assault tanks, and all tanks, firing their cannon and machine guns, advanced slowly with the infantry. The entire attack was so confusing to the enemy that they did not fire any of their defensive concentrations.

Once in the village, the tanks ceased firing except on request of the infantry who were busy mopping up resistance consisting of isolated and bewildered groups of enemy firing from houses and courtyards. The infantry and tanks moved swiftly to the parts of the town assigned to them, and upon cleaning out the enemy resistance, set up the previously planned defenses. Enemy tanks were encountered in the west end of town and were driven out. Two enemy tanks with their engines running were abandoned by their crews. While attempting to escape from the village a German self-propelled 380mm assault gun mounted on a Mark VI chassis was destroyed at seventy-five yards by the 76mm gun of a platoon command tank.

The advance to the village in the darkness was not without loss, however. During the darkness the command tank of Company C and another tank fell into adjacent bomb craters. On the way forward one tank of the reserve platoon and the T-2 tank retriever from company maintenance stopped to pull the two tanks out of the craters. Unfortunately dawn came just as the last tank was pulled out. With the arrival of dawn came visibility for the enemy tankers and antitank gunners concealed along the exposed eastern flank. The enemy fired five rounds, quickly destroying all the armored vehicles and wounding the company commander. If the attack had begun at 4 a.m. as initially planned these losses would have been avoided. With daylight, enemy artillery, mortar and tank fire commenced falling on the recently captured objectives. One of the tanks of Company C moved to an exposed position at the perimeter of the village from which it could fire upon an observed enemy tank to the north, but was destroyed by a second enemy tank to the east before it was able to fire a round.

Results of the Night Attacks February 25-26: In the night attack on Lich by the 2d Battalion, 94 prisoners of war were taken, many enemy were killed, one enemy tank was destroyed, several antitank guns were overrun, a strongly held village was captured within two hours.

The attack by the 2d Battalion north of Lich was met initially by dug-in enemy. Forty enemy soldiers were captured, several were killed, and others fled into the darkness.

In Oberembt, elements of the 11th *Panzer* Grenadier Regiment and the 301st GHQ Tank Battalion were surprised by the assaulting force. This resulted in many enemy killed, and 168 captured. Two enemy tanks and an assault gun were captured or destroyed along

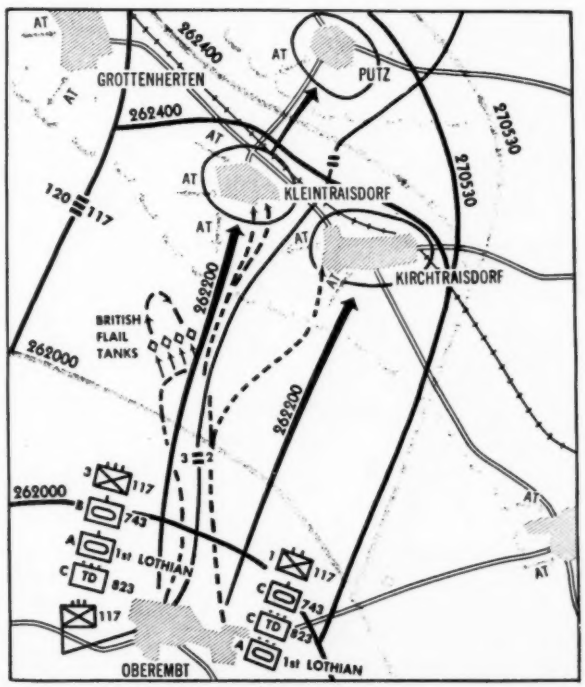


Figure 3

with many antitank guns.

The losses to the attacking forces during the hours of darkness were negligible. The major losses occurred after daylight February 26, and resulted in the destruction of four medium tanks and one tank retriever of Company C, 743d Tank Battalion. Without doubt, heavy losses would have been inflicted on the assaulting force if the attacks had been attempted during daylight.

c. Attack on Kirchtraisdorf, Kleintraisdorf and Putz. —On the night of February 26-27 the attack continued and resulted in the capture of Kirchtraisdorf, Kleintraisdorf and Putz. Warning orders for the attacks on these villages were issued early on the morning of February 26, thus allowing time for necessary reconnaissance, planning, and preparatory moves. At 6 p.m., the battalion commanders, tank company commanders, and the commanding officers of "A" Squadron, 1st Lothian and Border Yeomanry were briefed for the attack at the regimental command post in Oberembt. "A" Squadron was a British flail tank company attached to the 743d Tank Battalion for the purpose of breaching any enemy mine fields encountered. See Figure 3.

The artillery plan, the method of control and communication, and the conduct of the attack followed the same general pattern as the attack on Oberembt. However, several different problems presented themselves. First, the 3d Battalion with Company B, 743d Tank Battalion was in regimental reserve in Steinstrass, and had to move to Oberembt after twilight on the 26th and still attack in time to capture its objective before midnight. This meant marching 3,000 yards, assembling in an attack position behind the line of departure, and passing through another unit under the cover of darkness. Second, during the short period of time the 3d Battalion was passing through to Oberembt the entire regiment was concentrated in the small village and was exceedingly vulnerable to an enemy artillery concentration, or to having its line of communication cut by an enemy counterattack on Steinstrass and Lich. Third, the regiment was to attack two similar objectives less than 300 yards apart over some 2,700 yards of open terrain with two battalions abreast. Unless the assaulting units were carefully oriented and correctly led, the chance of attacking the wrong objective, or of attacking one another was very possible. Fourth, after the two objectives were captured, the regiment again had to "pull its tail up behind it" in order that the reserve battalion which had remained in Oberembt could pass through the 3d Battalion in Kleintraisdorf and attack Putz.

The 3d Battalion solved the first problem (a) by exceedingly detailed planning of the first forward movement, (b) by having all officers in the assault echelon make a personal route reconnaissance to the line of departure and (c) by having all officers and key noncommissioned officers study the aerial photographs and 1:25.000 scale maps carefully in an attempt to remember all details of the terrain.

The division furnished the solution to the second problem by planning artillery fire on all known enemy artillery positions during the period of the move, and by moving an attached Combat Command of the 2d Armored Division into Lich and Steinstrass to protect the east flank and the regiment's line of communication.

Close control and an excellent communication system were the solution to the third requirement. However, detailed planning, a thorough study of aerial photos and maps, and the use of white phosphorus to mark the objectives were also of importance in maintaining direction.

A division order moving elements of the Combat Command into Oberembt when the regimental reserve moved out was the answer to the fourth problem.

In spite of the great care taken to insure that all major difficulties would be anticipated and eliminated as far as possible, one unfortunate accident occurred.

The 1st and 3d Battalions were to cross the line of departure at 9:45 p.m., February 26, and attack northeast to their respective objectives. However, due to slowness in assembling for the attack, the 3d Battalion crossed the line of departure ten minutes late.

The 1st Battalion reinforced, moved along the road running north out of the northeast corner of Oberembt for about a mile when the assault tanks with the infantry turned northeast along another unimproved road that led to the objective. The four tanks of the British flail platoon following the assault echelon missed the turn and continued north toward the objective of the 3d Battalion. The British platoon leader soon realized he was lost and turned to go back the way he had come. See Figure 3.

The 3d Battalion, echeloned to the left and ten minutes behind the 1st Battalion, moved along the road running north from the northwest corner of Oberembt. When the lead tank platoon was halfway to its objective, the platoon leader observed the silhouette of four tanks approaching his platoon from the direction of the burning objective. He ordered his platoon to open fire and they succeeded in destroying all of the approaching tanks which were later identified as the lost British flail tanks. Except for enemy resistance the battalion continued its attack and seized its objective without any further difficulties.

Results of the Night Attacks February 26-27

The attacks on Kirchtraisdorf, Kleintraisdorf and Putz were successful. During the night over 100 prisoners were captured, many enemy were killed, and several antitank guns and vehicles were overrun. At daylight the remnants of an enemy infantry battalion crawled out of dug-in positions between the initial objectives and Oberembt and marched into Oberembt to surrender. These positions had been overrun during the night attack without opposition, the enemy in their terror preferring to hide in their holes rather than to fight. The prisoners were first-class German soldiers.

The attacks on this night advanced the 117th Infantry Regiment more than 4,000 yards on a 2,000-yard front to capture three enemy villages that were defended

by elements of two *panzer* divisions. The losses to the attacking forces due to enemy action were negligible.

Summary of Action

During the nights of February 25-26 and February 26-27, the 117th Infantry Regiment advanced 8,200 yards on a 2,000-yard front to seize five enemy-held villages, to capture over 300 prisoners, to destroy or capture five enemy tanks, to destroy or overrun many antitank guns and miscellaneous vehicles, and to kill many enemy.

The 117th Infantry Regiment had less than thirty men killed in action and the 743d Tank Battalion and its attached flail company had four killed in action, four tanks and one tank retriever were destroyed by enemy fire after daylight, and four British flail tanks were destroyed by friendly fire.

The 120th Infantry Regiment with the 744th Tank Battalion attached, attacked on the night 26-27 in conjunction with the 117th, advanced over 4,500 yards, and seized the villages of Kalrath, Grottenherten, and Kirchherten against resistance by enemy armor and infantry. The losses of the 120th Infantry were less than those of the 117th Infantry.

In these historical examples the results show the advantage of night attacks over daylight attacks. This can be even better illustrated by an attack during daylight which took place the following day. The conditions except for visibility were identical with the conditions met during the night attack. Within ten minutes after crossing the line of departure Company B, 743d Tank Battalion, lost eight tanks. The 119th Infantry Regiment with its remaining attached tanks and tank destroyers fought for fourteen hours to capture a village similar to the ones captured within two hours in a night attack.

Lessons Learned

1. A well planned night attack in which tank-infantry teams are employed is less wasteful in lives, time, and equipment than are similar daylight attacks.

2. Tanks should be employed with infantry in night attacks if the conditions are suitable.

3. Artillery preparations should be used at night when tanks and infantry attack as a team.

4. The line of departure should be secured prior to a night attack. The failure of the 1st Battalion to secure its line of departure for the attack on Oberembt early enough delayed the attack one hour and might have resulted in a failure to attack.

5. The execution of a night attack by the infantry and tanks should be fast and aggressive. During a night attack by tanks and infantry, speed and aggressiveness must not be curbed by an attempt to maintain secrecy. Stealth is not important in a tank and infantry night attack, because the noise of the tanks precludes it.

6. Thorough briefing and reconnaissance are essential. Reconnaissance will often be limited to a study of the map or an aerial photograph, or to long-range visual reconnaissance from an observation post.

7. Proper control and a dependable communication system are vital.

8. The plan for the defense of the objective after capture must be worked out in detail before the attack. It must be executed rapidly and prior to daylight. Each squad and tank must know, before the attack, its part in the plan for the defense of the objective when it is taken. In the attack on Lich and Putz the enemy counterattacked within an hour after the objective had been taken from them. The counterattacks failed because of the pre-planned defense of the objective. Artillery defensive concentrations must be pre-planned to box the objective in case of enemy counterattack.

9. If the objective of the night attack is a village, the attacking troops should attempt to pass through and secure the perimeter as rapidly as possible. Detailed clearing of enemy from buildings can be accomplished later.

10. Infantry-tank night attacks should be planned so that at least one objective is taken by the division before midnight, and a second objective before daylight. This should guarantee a deep penetration and a possible overrunning of enemy artillery positions. It will also disorganize the enemy defensive position and make the daylight attack the next morning less costly to our troops.

RIDING AND SCHOOLING HORSES

By The Late Brigadier General Harry D. Chamberlin

The Principles of Equitation are laid down in this book in language understandable by everyone. It is a book written to help the reader become a better horseman. There are chapters on Seat, Hands, Application of the Aids, Saddlery, Schooling, and Jumping. This famous book, which has been out of print for sometime, has been republished by the Armored Cavalry Journal. The price of the book is $4.00 a copy.

4th Cavalry Group In Combat

by Major Eugene J. Field

D-DAY marked the first appearance of elements of the 4th Cavalry in combat in World War II. Three missions were initially assigned the Group. All three were completely independent of each other.

Six thousand yards off the Utah Beach was the Illes Ste. Marcouf, consisting of two barren, rocky, windswept islands, the Ille de Terre and Ille du Large. Normally uninhabited, these ancient Napoleonic fortresses showed signs of trench works and gun emplacements according to our aerial reconnaissance. Because of their proximity to the landing beaches, they had to be seized and neutralized prior to H-Hour (6:30 a.m.) on D-Day, as they presented a definite threat to landing operations. Moreover, it was a most desirable site for our antiaircraft batteries that would engage the inevitable Luftwaffe. A task force consisting of two troops trained in amphibious operations, commanded by Lieutenant Colonel Edward C. Dunn, debarked from Southampton, England, on D minus one and were in position to make the seaborne landing at 2:30 a.m., D-Day. At 4:30 a.m., D-Day, two hours before H-Hour the force had landed as directed by Field Order Number One, VII Corps. This was prior to the entry of some of the glider and airborne units into France.

The 82d Airborne Division dropped on the early morning of D-Day. It was imperative that ground elements effect a link-up with them. Troop B, 4th Squadron, was assigned this mission. The troop landed with their vehicles at 9:30 a.m. on D-Day and fought their way to the town of Ste. Mere Eglise, 10 miles inland where contact was made with the 82d Airborne Division. The troop was used for combat patrols and security missions. During the period June 6 to July 3, the unit accounted for over 500 enemy killed or captured. They were able to infiltrate behind the lines of the confused and bewildered enemy and on several occasions caught German vehicular columns on roads and with canister and machine guns wreaked havoc with them.

The unit continued to be attached to the 82d Division in their advance up the peninsula, protecting supply lines, running down snipers, picking up stragglers, maintaining order, performing combat patrols and security for the Division. They assisted immeasurably in the success of the mission of the 82d Division, although suffering heavy casualties. One platoon was completely destroyed, however, the terrific toll in Germans killed and captured, enemy vehicles and material destroyed, more than balanced the scale in the operation.

Normandy Operation

On June 15, the remainder of the Group landed at Utah Beach and all units reverted to their respective squadrons. The 4th Squadron was attached to 9th Infantry Division that was attacking north on the west side of the Cotentin Peninsula and the 24th Squadron was attached to the 4th Infantry Division that was attacking north on the east side of the Cotentin Peninsula. Both units were completely detached from group control and operated independently of each other approximately 20 miles apart. Initially, the 4th Squadron was used to maintain contact between the 9th Infantry Division and 79th Infantry Division which were attacking abreast in a drive north to capture the prize port of Cherbourg. In its drive west to seal off the peninsula, the 9th Infantry Division was able to reach the west coast of the peninsula. This put the left flank of the division on the channel but as they advanced north toward Cherbourg, they moved in from the channel thus exposing their flank. The 4th Squadron was then relieved from maintaining contact between the 79th Infantry Division and 9th Infantry Division and shifted to screen and protect the left flank and rear of the 9th Infantry Division. This action was performed mounted.

The advance was swift over the narrow hedge-lined Normandy roads. However, the Germans had sufficient time to prepare excellent positions and although they were overwhelmingly outnumbered and sealed off, the terrain and road net offered no opportunity for a wide end run. Prior to the final drive into Cherbourg by the 9th Infantry Division, the 4th Squadron was given the mission of holding a line which was a prolongation of the infantry line approximately 15 miles south of Cherbourg. From this line dismounted patrols were able to infiltrate in enemy rear for periods as long as three days and to direct Division and Corps artillery on highly prized targets. It was here that it was forcibly demonstrated that there is no such situation as a static one in the true sense. Whenever in contact with the enemy in defense or holding, aggressive action must be the order and patrols must be constant, both day and night, continually probing for a hole or an indication of weakness on the part of the enemy. After the fall of the city and part of Cherbourg, there still remained a long tip of peninsula extending northwest into the English Channel. There were still a large number of enemy troops and installations in the area. It was generally conceded that these enemy troops although scattered constituted a threat. Moreover, information was received through intelligence agencies that these troops

were heading for the isolated beaches that offered them escape routes where they could move by sea to southern France to rejoin uncommitted German units.

The 4th Squadron was given the mission of working out to the northwest tip of the Cotentin Peninsula to capture or destroy all enemy troops, neutralize enemy gun and fortification emplacements, and seal off all escape routes. The resistance was rather sporadic but large numbers of enemy personnel and equipment were captured. This is but another incident of a job falling under the heading of a special operation that can be handled by cavalry with its mobility and ability to cover a large, lightly held area. The use of cavalry in this clean-up operation, precluded the necessity of detaching a battalion of infantry which would not have been able to move as quickly or the use of an armored unit which was not available at the time.

On June 15, the 24th Squadron was attached to the 4th Infantry Division and the mission of relieving the 22d Infantry of that Division along the Sinope River and maintaining a counterreconnaissance screen to the front. The 22d Regiment had been the right flank regiment in the Division attack and had suffered heavy casualties after nine days of furious fighting. The 8th and 12th Infantry Regiments were committed and no other reserves were available. The reconnaissance troops were dismounted and moved into the infantry sector with E Troop furnishing artillery support and F Troop tanks in reserve. The German counterreconnaissance was particularly aggressive, attempting to penetrate the cavalry positions in platoon strength on several occasions, but were successfully repulsed. After holding the line three days the squadron was given the mission of establishing a bridgehead on the far side of the Sinope River.

Because of the extreme frontage of the unit and lack of battle experience the crossing was made by one reconnaissance platoon. The battle wise Germans allowed them to cross and then proceeded to annihilate the platoon. Although the platoon put up a grand fight all but two members were killed or captured. The tank troop was then given the order to cross the river under the protective smoke and artillery of the E Troop assault guns and the combined mortar and machine guns of the reconnaissance troops. A successful crossing was made against a numerically superior enemy that withdrew. However, the doctrine was then and there driven home to all concerned that any river crossings must be made with force, previously coordinated, and of sufficient strength to hold the ground once the crossing is made.

After the bridgehead was firmly established the Germans started a withdrawal north toward Cherbourg. The 24th Squadron was then remounted in their vehicles and assigned the mission reconnoitering north and east along the peninsula to secure bridges before they could be destroyed by the enemy. They were also instructed to determine the main line of enemy resistance and keep contact with it. This was done in order that the infantry could be moved to the area for a full-size attack rather than dissipate its force on small piecemeal attacks. The 24th was able to locate and maintain contact with the enemy. The 4th Division was moved up and successfully attacked. The squadron then was again reconnoitering the east flank of the Division and protecting their supply lines. In the course of the reconnaissance a large airport, manned by a group of young fanatical German air cadets with a large number of dual purpose antiaircraft guns, was by-passed as it was thought that after the airport was surrounded the force would capitulate. This was erroneous and the entire 22d Infantry had to be turned around and a concentrated attack on the airport by the 22d Regiment and the 24th Squadron. After a terrific battle the airfield was overrun. This was a good example of the fallaciousness of by-passing strong enemy on the flanks, allowing them to cut supply roads and harass reserves.

The 24th Squadron continued to be attached to the 4th Infantry Division performing flank security until the fall of Cherbourg which marked the fall of the Normandy Peninsula and the close of the Normandy campaign. The 4th Cavalry Group was then assembled at Beaumont Hague about 10 miles west of Cherbourg where they were attached to 101st Airborne Division with the mission of patrolling roads, capturing or destroying all German stragglers, locating all enemy gun emplacements, supplies, and fortifications. The units also assisted civilian authorities in maintaining order. Particular vigilance had been ordered as intelligence agencies had informed the Group that information had been received to the effect that the Germans were planning an airborne offensive in the Cherbourg area to regain the ground they had lost and push the American forces back to the sea. Fortunately no German airborne attack was launched and the units had time to refit, reequip, and do the necessary maintenance.

The first campaign had drawn to a close, every element of the 4th Cavalry Group had been introduced to warfare in 39 days of intensive combat. The mission for the most part had been dismounted and the fighting at times confused, but though new in combat, organized, equipped and trained for mounted action, the squadrons tackled every mission with determination that made the operations completely successful.

The conclusions drawn at the end of the campaign were that there is no substitute for training. The units must be thoroughly indoctrinated in all phases of war. They must know their weapons, vehicles, radios, they must be able to read a map, they must be thoroughly familiar with tactics from the squad to the squadron. Above all, the units must be physically fit and the leaders are responsible that everyone is possessed with the morale and *esprit* that is necessary to win battles. Without it a unit can go nowhere. Once an outfit is committed, it is too late to learn the basic principles that are laid down by the "Book." These principles must be taught prior to combat and with very few possible exceptions they will pay off.

Armored Division Associations

1st Cavalry Division

General of the Army Douglas MacArthur and General Jonathan M. Wainwright have accepted honorary membership in the 1st Cavalry Division Association, it was announced this month by Major General William C. Chase, president of the Association.

In December the Association mailed its Membership Directory of 105 pages listing all the names and presently known addresses of Association members. The directory is prefaced with letters from General Chase, Major General Verne E. Mudge, Chairman of the Association's Executive Committee, and Major General Innis P. Swift, first president of the Association and former commander of the Division and of I Corps.

Local chapters of the 1st Cavalry Division Association are being formed at Fort Knox, Kentucky, New York, Massachusetts, Illinois, in addition to the one at El Paso, Texas, which is well under way.

Colonel Edmund P. Stone, Registrar of the Association, strongly urges all members to mention their unit or organization in all correspondence with the Registrar's office. His address is: Registrar, 1st Cavalry Division Association, P. O. Box 201, Pomona, California.

Aims and objects of the 1st Cavalry Division Association as set forth on the first page of the new Membership Directory are: "The 1st Cavalry Division Association was organized in the Admiralty Islands with the common aims to perpetuate the fine traditions and the gallant accomplishments of the Division; to provide a suitable memorial dedicated to the memory of our fallen comrades; to the establishment of an endowment program to continue as a lasting reminder in their memory; to preserve and strengthen the fine friendships that found root during our service in the 1st Cavalry Division, and to be mutually helpful to one another in the years which lie ahead."

3d Armored Division

News item number one for the Spearheaders is the nomination by the President of Brigadier General Doyle O. Hickey to be a permanent Major General. General Hickey commanded "CCA" throughout the training period of the division in the United States and England, and in combat until March 30th, 1944. At the time General Maurice Rose was killed in action, General Hickey assumed command of the division and commanded the 3d Armored throughout the remainder of its combat and occupation duties in Germany.

The Chicago Chapter Spearhead Dance, held at the Knickerbocker Hotel on the 21st of November, was most successful. Art Rutshaw, president of our Chicago Chapter, reports that over one thousand people attended. Chief Garner and Dick Raabe did exceptionally fine jobs on the entertainment committee. Congratulations to the Chicago Chapter; we know they will be grand hosts to our reunion next April.

A New England Chapter Dance will be held for all Spearheaders in that area on January 17th at the Boston City Club, from 8:00 until 12:00. Paul Corrigan, president of the New England Chapter, writes:

"We will have a bar set up for those who want drinks, and an orchestra will be there for the jitterbugs. This is a chance for Spearheaders to show off their buddies to their wives and sweethearts, and vice versa. Tickets are $2.50 per couple. Please do not wait to be contacted —send your money to Paul Corrigan, 77 Green Street, Lynn, Massachusetts. All Spearheaders who read this are urged to contact their buddies whose address we may not have. Make up parties and come and have a grand time. Remember the fun we all had at the last party!"

We had a long letter from Walt Stone of 126 State Street, Boston, telling us about a very successful reunion some of the boys from "A" Battery, 486th, had a little while ago in Boston. Dick Goodie and Herb Reali, both of Portland, Maine, sent out a few post cards to meet at the Silver Dollar Bar in Boston on Sunday, October 12th. As a result forty-three men turned up. We haven't room here to list those present, but New England's every corner was well represented.

Our November Newsletter announced the definite dates of April 8th, 9th, and 10th, 1948, for the first annual Spearhead Reunion in Chicago, Illinois. We have sent out publicity releases to one hundred twenty-five leading newspapers, with the request that they publish the announcement for us. We have mailed out 2500 registration cards to our members, with a request that they send them in at an early date. Despite the fact that most Spearheaders have been busy with the Christmas holidays we have received over one hundred registrations in the first three weeks. Every indication is that there will be at least two thousand Spearheaders at the convention.

If you have not received a registration card please write to the Association headquarters at Fort Monroe without delay. We will send you one by return mail.

5th Armored Division

September was the first anniversary of the 5th Armored Division Association. Through the efforts of Lieutenant Colonel Fred Ressegieu a correct mailing roster of nearly ten thousand names of the 5th's fighting men has been compiled from information supplied by former members. Lieutenant Colonel Ressegieu left Washington in early fall to attend the Command and

General Staff School at Fort Leavenworth. Since that time Major Emerson F. Hurley has been the acting secretary-treasurer. The records of the association are now in the office of Colonel John T. Cole at the Pentagon.

An excellent history of the 81st Tank Battalion is now being distributed. Information may be secured from C. P. DeBevoise, 5105 Browvale Lane, Little Neck, New York.

The Los Angeles Chapter of the 5th is now second to Chicago in activity and members. Dorsey B. Cole has been acting president, and 50 members attended the last meeting. Cole's address is Box 201, Kruse Road, Pico, California.

The Fifth Armored Division Association will hold its Second Annual Reunion on August 12, 13, and 14, 1948 at the Hotel Carter in Cleveland, Ohio. Thomas B. Bartel, convention chairman, will have a more complete announcement in the next issue of the Division NEWS magazine, which will be out February 1st, 1948.

Louis F. Filas, newly appointed Secretary-Treasurer to the Fifth Armored Division Association, reports from their new location that Chapter activity is high. Newly formed, there is a Cleveland Chapter that will aid in putting over the Association Reunion that will be held in their city in '48.

All Ohio shows progress in anticipation of being hosts to their comrades. Akron and Youngstown also boast of a recently organized group. Information regarding any phase of activity can be had by writing the Association at 4612 Center Avenue, Lyons, Illinois.

The Division History has been finished by Major Emerson Hurley, and will soon be readied for printing.

* * *

6th Armored Division

Definite plans have been made for the first annual reunion of the 6th Armored Division Association in Louisville, Kentucky, on July 30, 31, and August 1, 1948. Arrangements have been made with the Louisville Convention Bureau whereby adequate hotel accommodations, reunion halls, and dining rooms will be made available for all units of the Division who desire to hold reunions in conjunction with the Division reunion. The 68th Tank Battalion and Company B, 9th Infantry have already scheduled their reunions for the above dates.

In view of the fact that personnel on active duty are subject to change of station orders so often, including overseas service, it is the recommendation of the present committees that when permanent Association officers are elected at the annual reunion, they be selected from members now on inactive duty.

The 68th Tank Battalion held their reunion in Chicago on August 30, 1947, the attendance was excellent and everyone enjoyed themselves to the utmost. The schedule included a memorial service, a business meeting, a banquet in the evening and opportunity for buddies to get together and "fight" the war over again.

Local Chapters, "Task Forces," are now being organized. The goal is to initiate a "Task Force" in every city where several Super-Sixers reside. The cooperation of all former members of the Division is urgently needed to make the Task Forces successful organizations. "Task Force Kentucky" has scheduled a business meeting and dinner at the Seelback Hotel in Louisville for the evening of January 17, 1948.

All former unit commanders are being urged to form Unit associations and to schedule their unit association reunions at the same place and on the same dates with the Division reunion.

Inquiries regarding the Association may be addressed to: Lieutenant H. C. Smith, Acting Secretary-Treasurer, 6th Armored Division Association, c/o AGF Board No. 2, Fort Knox, Kentucky.

* * *

11th Armored Division

Thanks to all of you who sent us so many Christmas cards and Holiday Greetings and we sincerely hope that each of you will have a Happy and Prosperous New Year.

For some reason or other, contributions for the "news notes" are rather scarce even though we have diligently solicited information from all the local chapters.

The Cleveland Chapter had its first meeting on December 2 at the residence of Ernie Perlmuter with about 20 fellows present. Charles Starrett was elected temporary chairman. Committees were selected for the housing of the meetings and membership. Practically all members in that area reached by post card stated they were definitely interested in a local chapter and in its future meetings. Another meeting will be held in January—date not yet decided.

A discouraging letter has been received from John Campora who is endeavoring to organize the New Orleans Chapter and it seems like he can't get much cooperation from the members to attend meetings. We hope the next meeting will be more successful. We also hear that "Scotty" Parker is due to be transferred from New Orleans to the Texas area.

Russell V. Bancker (Secretary of the New York Chapter, who is "really on the ball" with news notes) writes us about the clever idea to raise funds for the chapter's use. It seems that one member donated a silver flatware service for 12, another member printed and donated the raffle books and the service is being raffled by the members of the chapter. Results of the sale of tickets so far are very good and they will have their "drawing" at the February meeting. At the December 5 meeting, a generous donation of $25.00 was made to the Christmas funds of both Kingsbridge and Halloran Veterans Hospitals in New York. They hope to establish contacts with the various local newspapers to carry notices of their meetings which they hope will increase their attendance.

John Janecek (Band) of Lincoln, Nebraska, tells us

he will be moved into his new house by January 15 and plans to have a meeting of the Eleventh members in that area the middle of February. Says he is going to do his best to get Nebraska organized, to insure a good "corn husker" turnout at the New York convention in August.

We hear from Chicago that Bill Lipp is leaving the Windy City to reside in the New England area. Clarence Torrey is in charge of the Chicago Chapter, pro tem, until another election of officers is held. Incidentally, Torrey is no longer with Eastern but is now Resident Manager for Security Banknotes Company.

Mr. and Mrs. Francis P. Kane, Jr. of Media, Pennsylvania (22 T), visited our office on their way back from Atlanta, Georgia, and he promised to contact Lewis Conine regarding the organization of a Philadelphia Chapter. Edwin L. Dannes (Band) stopped by one day to tell us that he is now one of a "trio" playing at the popular Neptune Room here in Washington. Wilbur J. Spranzy (41 T) of Durham, North Carolina, visited his sister in Washington for Thanksgiving and stopped in to say hello.

General Willard A. Holbrook, Jr. made a flying business trip to the West Coast and then on to Honolulu. He spent a little time while on the trip with "Pete" Kilburn. The only member we had a record of being in Honolulu, Albert G. Oertel (DA), is now working for the Weather Bureau at the Airport in Phoenix, Arizona. General Holbrook says he spent some time trying to locate any other members in Honolulu but could not find any.

Staff Sergeant John Stoughton, Ward Nine, Section Nine, Percy Jones General Hospital in Battle Creek, Michigan would like to hear from any of the gang in the 42 Tank Battalion.

William F. Lightholder wants to know if anyone has any extra copies of the two booklets put out in Austria by the 41 Tank Battalion. He was in the hospital when these were passed out and did not receive either of them. If you will mail them to him at 306 West 15th St., New York, New York, he will be glad to get them.

A letter from Lieutenant Maurice Young, now on duty in Yokohama, says he is looking forward to the time when he can take an active part in the L. A. Chapter, and mentions that Lieutenant Edward J. Garrett (492 AFA) is also stationed in Yokohama.

Major John M. Gaustad, now in Seoul, Korea, writes that he was glad to get the news of the convention and hopes to return from the Orient some time in July, to enable him to attend the next convention in New York. Among the other former members of the Eleventh that he has located in Korea are Major Charles Cherry (Div G-3), Captain Spencer (CCB), Captain McCoy (41 T), and Captain Cooper (55 AIB).

Fred B. Proctor (56 Eng) sends word from Richmond, California, that he is working for a Master's degree in Engineering at the University of California. He also mentioned that Captain Blackburn is now studying dentistry in Columbus, Ohio, and that Lieutenant S. A. Scearce now has a fine job with Standard Oil, after spending two years in the hospital.

A note from Beryl W. Sprinkel (22 T) informs us that he is attending the University of Chicago and that he has seen Zimmer and Bob Blackburn, who are also students there.

Roy Orsolini, Route One, Box 228A, of Lathrop, California, would like to hear from fellows of the 41 Tank.

Theron H. Masten (41 T) of Rapid City, Michigan, writes that he had a "whale of a time at the Chicago convention and wouldn't have missed it for a million." Edwin Lundberg (401 AFA), way out in Ione, Washington, was glad to know it was such a success and is looking forward to the time a convention will be held on the West Coast, a little closer to home.

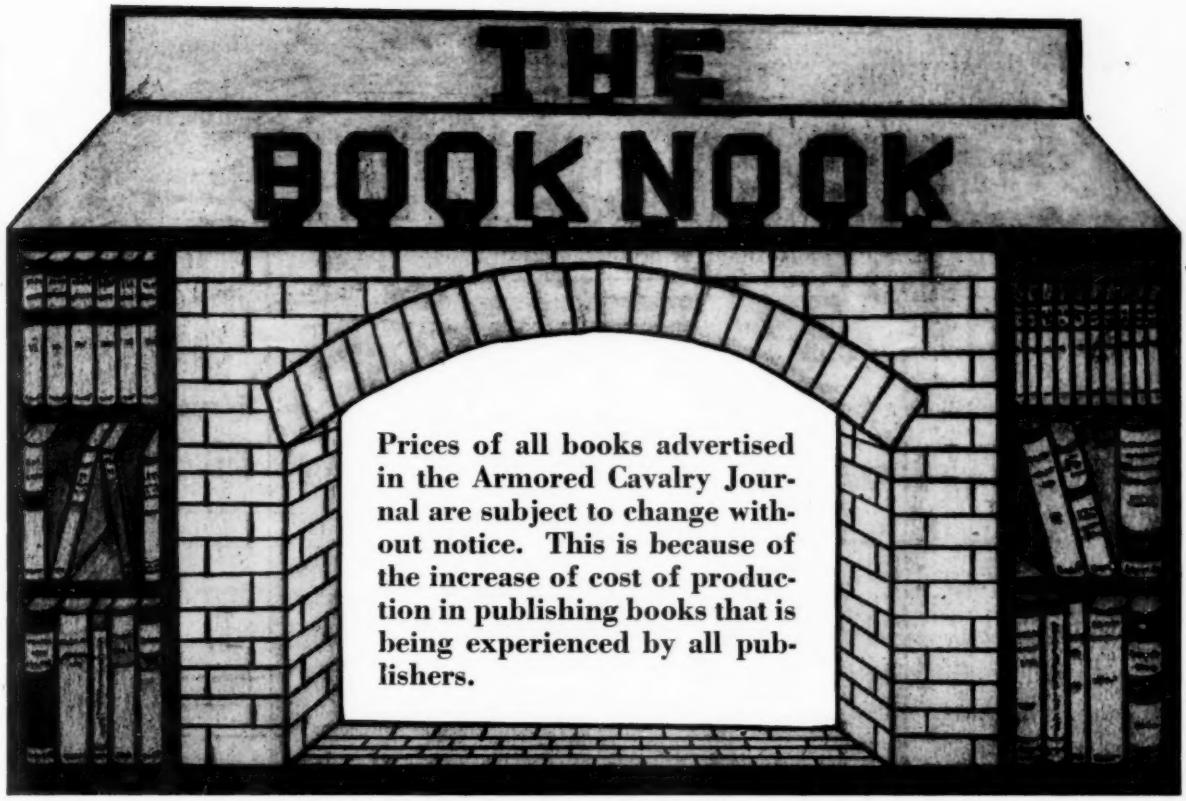
A card from Robert J. Lewis (133 ORD) lets us know he is now with the Chevrolet Motor Division in Iowa City.

A letter from Leroy H. Richtin (81 Med) says he wasn't aware that the 81 Med was part of the Eleventh Armored Division, but we have given him all the dope on it.

We have received many more letters of good wishes for the association, compliments on the "Newsletters" and of course, a few "gripes" we hope we have taken care of. Again, we ask any and all of you readers to send us any sort of "news" that you think other members might be interested in reading.

We have just received a letter advising us that at the meeting of the Los Angeles Chapter on November 25th, the following officers were elected for the 1948 term: William Cohen, President—Col. W. J. Scott, Vice President—T. R. Anderson, Secretary—Isaac Kramer, Treasurer. Willard N. Rayburn, F. W. Hunter and Charles B. Moore were named as Trustees for the Chapter. They also appointed a membership committee, headed by Isaac Kramer, to promote an extensive membership campaign by mail. Yearly dues will be $5.00 of which $4.00 will go to the local chapter and $1.00 to the National Association. The next meeting of the Los Angeles Chapter will be held on January 13th at Betty's Broadway Circle at 1016 South Broadway in Los Angeles at 8:00 P.M. and we sincerely hope they have a grand turnout for the meeting. They expect to have definite figures on their membership after the January meeting.

Miss Natica A. Brown, who handles all administration of the Association, wants to thank the many thoughtful Thunderbolts who sent her Season's Greetings.


THE
BOOK NOOK
Prices of all books advertised in the Armored Cavalry Journal are subject to change without notice. This is because of the increase of cost of production in publishing books that is being experienced by all publishers.

THE BLUE DEVILS IN ITALY. By John P. Delaney. Infantry Journal Press. $5.00.

Most Army unit histories follow the same general pattern, and their interest is limited to those who served with the respective organizations, and to students of military history. There is wider interest in *The Blue Devils In Italy*, the history of the 88th Infantry Division, a timely release available as the last elements of the organization are returning to the States in the withdrawal of all troops from Italy, Mr. Delaney has covered a good portion of the Blue Devil occupation of one of the world's key trouble spots. There is additional interest in the tie-in of this story with the continuing mission of the 5,000-man Blue Devil Brigade remaining on in the Trieste Free Territory. This is an important book to American citizens who wish to keep in touch with our outposts of democracy.

EQUESTIONNAIRE. By Colonel Harry Disston; Illustrations by Paul Brown. A. S. Barnes & Company. $3.00.

For those who have said "What I don't know about a horse would fill a book," the book they are speaking of is Colonel Disston's *Equestionnaire*. This is an entertaining and instructive compilation of facts about horses. It is divided into sections covering such subjects as anatomy, stable management, first aid and shoeing, tack and equitation, hunting, racing, polo, horse shows and several others, all presented in a question and answer form. Paul Brown's drawings are fine as always, and serve as graphic presentations of many of the author's points. A book for all who want information on things concerning horses.

CAR OWNER'S GUIDE TO CARE AND REPAIR. By Walter Altschuler. Tudor Publishing Company. Paperbound, $1.50; Cloth, $3.00.

A more down-to-earth offering for the average car owner on how a car is put together, with information as to how and when to do something to prolong its life. Contains helpful illustrations and easily understandable text.

THE MEANING OF TREASON. By Rebecca West. The Viking Press. $3.50.

There are many tangents to the tragedy of war. In her book *The Meaning of Treason*, Rebecca West has enlarged on the treason theme, a story of several English traitors of World War II. Bulk of the book is devoted to William Joyce, the famous Lord Haw Haw, whose propaganda broadcasts bombarded the English air waves during the war. There is also the account of the trial of John Amery. Miss West probes very deeply into background on the human side.

THE FOREIGN AFFAIRS READER. Edited by Hamilton Fish Armstrong. Harper & Brothers. $5.00.

This is a compilation of twenty-nine articles extracted from the quarterly publication, *Foreign Affairs*. All military personnel should read it as a part of their grounding in foreign affairs. Presented here are articles by outstanding men of this and other countries on a range of subjects that provides a real appraisal of the between-the-wars period, pointing up an understanding of some of our present-day problems.

THE HORSE of the DESERT

By W. R. BROWN

$10.00

The Horse of the Desert, written by America's greatest authority on the subject, is the only book on the Arabian horse now in print. It contains an extensive list of the principal Arabian tribes, subtribes and clans; the most complete and authoritative lists of the strains and families of the Arabian horse; the largest bibliography on the subject; a map showing the regions most suitable for breeding horses in the United States, and the Arabian ancestry of most of the present-day breeds.

Lavishly illustrated with about 200 reproductions of drawings, photographs, paintings and four-color plates.

Author W. R. Brown was president of the Arabian Horse Club of America for many years, and a member of the United States Remount Council. He has travelled extensively in the Arabian Desert in search of fine horses, and has handled more Arabians than anyone in America.

BOOK DEPARTMENT

Armored Cavalry Journal

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THE GHOSTS OF PATTON'S THIRD ARMY: A History of the Second U. S. Cavalry. By Major A. L. Lambert and Captain G. B. Layton, Historical Section, Second Cavalry Association. $3.00.

This is a comprehensive history of the Second Cavalry, and its World War II contemporaries will enjoy reading of the rich tradition of their outfit, from the engagement of the Second Dragoons at Oloklikaha on the Withlacoochie River in the Seminole Indian Wars in Florida in the year 1836, on through the postwar duty as Constabulary troops in Germany. Most interesting will be the section in which the reader helped write the history of this unit through his active service as a member—the combat period from the landing on the Normandy Beachhead on through the fighting in France and Germany, and across the Czechoslovak border to a VE blessing in the Pilsen area. As a cavalry unit in a cavalryman's Army, the Second Cavalry saw plenty of action, and the story, spiced by the contributions of many of those who lived it, makes fine reading.

OURS TO HOLD IT HIGH: History of the 77th Infantry Division. Edited by Lieutenant Colonel Max Myer. Infantry Journal Press. $6.00.

This book tells the history of the well-known Pacific division that made contact with the famous 1st Cavalry Division at Lonoy, Leyte, to break the back of the Yamashita Line and bring the Leyte Campaign to a successful close. The book is the complete history of the 77th Division's World War II activities.

SILVER KINGS. By Oscar Lewis. Knopf. $4.00.

A story of the four leading figures in the exploitation of the famous Comstock Lode silver mines in Nevada. We recommend it as good background on America.

AMERICA IN PERSPECTIVE. Edited by Henry Steele Commager. Random House. $4.00.

Some three dozen foreigners express their views on Americans in this compilation of essays by one of our better known historians.

THE UNITED STATES AND RUSSIA. By Vera Micheles Dean. Harvard University Press. $3.00.

With a foreword by Sumner Welles, this is a book for all interested in one of the major problems of the day. Miss Dean is a recognized specialist on Russian affairs.

NEWS LETTERS OF ABIGAIL ADAMS. Edited by Stewart Mitchell. Houghton Mifflin. $5.00.

Mr. Mitchell of the Massachusetts Historical Society has compiled here 141 letters written by the wife of John Adams to her sister during the period in which her husband served as Vice President and President.

LEWIS AND CLARK. By John Bakeless. William Morrow & Company. $5.00.

Always popular are the stories of the American West in the days when a handful of brave adventurers were pushing forward our frontier. Mr. Bakeless has given us the story of two of the most intrepid of our frontiersmen on the expedition that was to probe our wilderness and strike the Pacific coast. A detailed story with excellent maps, illustrations and photographs.

WIRING A CONTINENT. By Robert Luther Thompson. Princeton University Press. $7.50.

More background on America. This is a subject with which many of us are casually familiar, either through our school courses or in popular movies, but this treatment is more detailed and objective, and is basic Americana.

THE MUZZLE-LOADING CAP LOCK RIFLE. By Ned H. Roberts. The Military Service Publishing Company. $7.50.

For gun collectors and anyone interested in firearms and shooting, here is a book to satisfy a technical demand, and one with the additional value of fine story-telling.

THE STAINLESS STEEL KIMONO. By Elliott Chaze. Simon & Schuster. $2.75.

Mr. Chaze has written a story of a group of postwar occupation soldiers on duty in Japan, not a real account of any particular real-life figures, but a story of many of our occupation men today. It is a good story, at once humorous and grim.

TIME AND CHANCE. By Cyrus LeRoy Baldridge. The John Day Company. $7.50.

Here are 432 pages of sketches and copy by an author-artist whose young life was of a footloose nature of necessity, and whose later life sustained the wanderings by choice. The broad outlook pays off in a worth-while result.

THE SIERRA NEVADA. Edited by Roderick Peattie. The Vanguard Press. $4.50.

All angles are covered in this story on one of the world's most beautiful mountain ranges; birds, trees, flowers, climbs, sports, geology, characters. When you have finished you'll want to go West.

F. D. R., HIS PERSONAL LETTERS: EARLY YEARS. Edited by Elliott Roosevelt. Duell, Sloan & Pearce. $5.00.

A collection of letters of the late President Franklin D. Roosevelt to his mother, covering the period of his life from early childhood through his graduation from Harvard. The first of three volumes.

WAR AS I KNEW IT

By GENERAL GEORGE S. PATTON, JR.

$3.75

Contained in this book are the rules and principles forged from General Patton's fighting experience in three wars, principles which constantly illuminate his thoughts and actions. It is the book that all students and believers in General Patton and his Third Army have been waiting for. Most of the book has been written from the diary that General Patton kept from July, 1942, until December 5, 1945, four days before his fatal accident.

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War As I Knew It includes an account of the Third Army's campaign that is prefaced by a group of open letters from North Africa and Sicily, letters about the non-military aspects of Operation "Torch" and Operation "Husky" and is followed by two chapters in more personal vein. "Reflections and Suggestions" is the distillation of the General's military philosophy, and the last chapter, "Earning My Pay," is an account of the tight spots in his long military career.

BOOK DEPARTMENT

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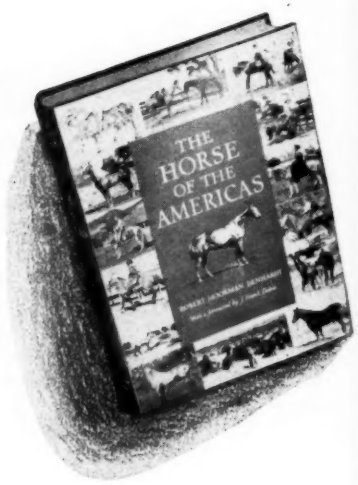
By ROBERT M. DENHARDT

THE HORSE OF THE AMERICAS

Foreword by J. FRANK DOBIE



In the only book of its kind, the editor of *The Western Horseman* tells the fascinating history of the arrival, spread, and development of the Spanish horse in the Americas—the Mustang, Quarter Horse, Appaloosa, Pinto, Palomino; the *Criollo* of Argentina, Uruguay and Brazil, the *Costena* and *Chola* of Peru, and the *Caballo Chileno*. Separate sections are devoted to these and other modern breeds and an appendix discusses the light and heavy breeds of the Eastern United States and their influence on the Western horse. Riding techniques, saddle, and equipment also take their part in the story. It provides a comprehensive account of the place of the horse in the conquest of the Americas.

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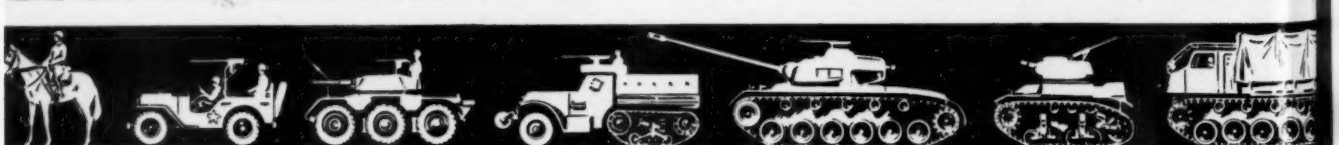
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